Appendix D: State-Specific Recommendations

This appendix provides a complete list of recommendations for each state to improve their capacity to address stormwater-related climate impacts by revising their post-construction stormwater standards. The recommendations are organized into five categories: 1) Modern Manual, 2) High Precipitation, 3) Drought, 4) High Temperature, and 5) Sea level Rise. Note that many of the Modern Manual recommendations will also be helpful to adapt to specific climate impacts. Click on your state to view the recommendations.

Alabama
Alaska
Arizona
Arkansas
California
Colorado
Connecticut
Delaware
District of Columbia
Florida
Georgia
Hawaii
Idaho
Illinois
Indiana
Iowa
Kansas
Kentucky
Louisiana
Maine
Maryland
Massachusetts
Michigan
Minnesota
Mississippi
Missouri
Montana
Nebraska
Nevada
New Hampshire
New Jersey
New Mexico
New York
North Carolina
North Dakota
Ohio
Oklahoma
Oregon
Pennsylvania
Rhode Island
South Carolina
South Dakota
Tennessee
Texas
Utah
Vermont
Virginia
Washington
West Virginia
Wisconsin
Wyoming

Complete List of Recommendations by Category for Alabama

Modern Manual

• Apply standards statewide.
• Reduce the disturbance threshold to less than 1 acre.
• Incorporate channel protection sizing into existing standards
• Adopt specific numeric runoff reduction and water quality sizing standards.
• Update design storms to reference the most recent available storm data.
• Require Green Infrastructure practices either explicitly or as a means of achieving a goal such as runoff reduction.
• Incorporate specific vegetation targets and/or a tree planting credit into standards.
• Ensure that practices are resistant to erosion. Methods include prescribing non-erosive storm events, providing detention at the inlet, or designing practices off-line.
• Provide filter media guidance to prevent clogging and ensure permeability.
• Standards should identify a specific ponding depth for filtering systems and bioretention.

High Precipitation

• Add a section that discusses climate change and recommends specific adaptation measures.
• For water quantity sizing, incorporate projected storm data or other options that account for increased storm depths due to climate change.
• Incorporate storms by reference rather than including maps or static images in standards.
• If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
• Incorporate additional space around BMPs to provide a right of way for large, intense storms.
• Increase the ponding depth for filtering systems and bioretention to prevent bypass of high intensity storm events.
• If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.
• Incorporate Smart BMP Technology into standards and provide recommendations for its use in adapting to changing storm patterns.
• Some plants on the landscaping list should tolerate to "wet feet" and frequent inundation.
• Consider biochar to increase filter permeability.

Drought

• Add a section that discusses climate change and recommends specific adaptation measures.
• Incorporate specific guidance for sizing rainwater harvesting systems.
• Modify existing water quality sizing to consider downstream ecology and quality.
• Prohibit or restrict the use of practices that consume water (e.g., practices with a permanent pool of water).
• Set specific goals for rainwater harvesting in the sizing criteria.
• Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in rainwater harvesting systems.
• The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
• Some plants on the landscaping list should be fire-resistant.
• Bioretention design should incorporate internal water storage.
• Consider adding polymers designed to retain soil moisture to bioretention specifications.

Sea Level Rise

• Add a section that discusses climate change and recommends specific adaptation measures.
• The climate change section should incorporate sea level rise.
• Consider salt water intrusion and sea level rise when siting stormwater BMPs.
• Revise stormwater BMP siting standards to incorporate sea level rise.
• Elevate outfall inverts to the level of the projected high tide.
• Incorporate check valves to prevent backup at outlet pipes.
• Incorporate features that allow for future practice modification as climate changes.
• Oversize pipes or open channels to account for lost storage from rising sea levels.
• Incorporate pumps or other features provide increased head during high tide into the conveyance system.
• Consider corrosion-resistance when selecting BMP materials.

Temperature

• Add a section that discusses climate change and recommends specific adaptation measures.
• Incorporate specific vegetation targets and/or a tree planting credit into standards.
• The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
• Select light colors for BMP materials such as permeable pavement to provide solar reflection.
• Incorporate temperature-resistance standards into BMP materials such as permeable pavement mixes.
• Consider the carbon footprint of BMP materials.
• Modify existing water quality sizing to consider downstream ecology and quality.

Complete List of Recommendations by Category for Alaska

Modern Manual

- Apply standards statewide.
- Adopt specific numeric runoff reduction and water quality sizing standards.
- Update design storms to reference the most recent available storm data.
- Require Green Infrastructure practices either explicitly or as a means of achieving a goal such as runoff reduction.
- Incorporate specific vegetation targets and/or a tree planting credit into standards.
- Provide filter media guidance to prevent clogging and ensure permeability.
- Standards should identify a specific ponding depth for filtering systems and bioretention.
- Bioretention designs should incorporate internal water storage.

High Precipitation

- Enhance the existing climate change section to recommend specific adaptation measures.
- For water quantity sizing, incorporate projected storm data or other options that account for increased storm depths due to climate change.
- Incorporate storms by reference rather than including maps or static images in standards.
- Revise stormwater quantity sizing to either over-control the storm event or match a historical peak discharge.
- If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
- Consider increasing the water quality storm depth to capture greater annual runoff volume.
- Provide a factor of safety when conveying the water quality storm, either by modeling a high-intensity storm or providing supplemental freeboard.
- Consider future floodplain extent when identifying potential locations for stormwater BMPs.
- Incorporate additional space around BMPs to provide a right of way for large, intense storms.
- Increase the ponding depth for filtering systems and bioretention to prevent bypass of high intensity storm events.

Drought

- Enhance the existing climate change section to recommend specific adaptation measures.
- Modify existing water quality sizing to consider downstream ecology and quality.
- Prohibit or restrict the use of practices that consume water (e.g., practices with a permanent pool of water).
- Set specific goals for rainwater harvesting in the sizing criteria.
- Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in rainwater harvesting systems.
- The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
- Some plants on the landscaping list should be tolerant to periods of prolonged drought.
- Some plants on the landscaping list should be fire-resistant.
- Bioretention design should incorporate internal water storage.
- Consider adding polymers designed to retain soil moisture to bioretention specifications.

Sea Level Rise

- Enhance the existing climate change section to recommend specific adaptation measures.
- The climate change section should incorporate sea level rise.
- Incorporate sizing standards adapted to sea level rise in coastal regions.
- Consider salt water intrusion and sea level rise when siting stormwater BMPs.
- Consider future floodplain extent when identifying potential locations for stormwater BMPs.
- Revise stormwater BMP siting standards to incorporate sea level rise.
- Elevate outfall inverts to the level of the projected high tide.
- Incorporate check valves to prevent backup at outlet pipes.
- Incorporate features that allow for future practice modification as climate changes.
- Oversize pipes or open channels to account for lost storage from rising sea levels.

Temperature

- Enhance the existing climate change section to recommend specific adaptation measures.
- Incorporate specific vegetation targets and/or a tree planting credit into standards.
- Some plants on the landscaping list should provide shading or cooling.
- The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
- Select light colors for BMP materials such as permeable pavement to provide solar reflection.
- Incorporate temperature-resistance standards into BMP materials such as permeable pavement mixes.
- Consider the carbon footprint of BMP materials.
- Modify existing water quality sizing to consider downstream ecology and quality.

Complete List of Recommendations by Category for Arizona

Modern Manual

- Develop a state stormwater manual.
- Revise standards to incorporate specific guidance for designing and selecting stormwater BMPs.
- Include a list of specific stormwater BMPs that are acceptable to meet standards.
- Apply standards statewide.
- Reduce the disturbance threshold to less than 1 acre.
- Incorporate channel protection sizing into existing standards
- Adopt specific numeric runoff reduction and water quality sizing standards.
- Update design storms to reference the most recent available storm data.
- Guidance should include Green Infrastructure practices.
- Require Green Infrastructure practices either explicitly or as a means of achieving a goal such as runoff reduction.

High Precipitation

- Add a section that discusses climate change and recommends specific adaptation measures.
- For water quantity sizing, incorporate projected storm data or other options that account for increased storm depths due to climate change.
- Incorporate storms by reference rather than including maps or static images in standards.
- If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
- Provide a factor of safety when conveying the water quality storm, either by modeling a high-intensity storm or providing supplemental freeboard.
- Consider future floodplain extent when identifying potential locations for stormwater BMPs.
- Incorporate additional space around BMPs to provide a right of way for large, intense storms.
- Increase the ponding depth for filtering systems and bioretention to prevent bypass of high intensity storm events.
- If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.
- Incorporate Smart BMP Technology into standards and provide recommendations for its use in adapting to changing storm patterns.

Drought

- Add a section that discusses climate change and recommends specific adaptation measures.
- Incorporate specific guidance for sizing rainwater harvesting systems.
- Modify existing water quality sizing to consider downstream ecology and quality.
- Prohibit or restrict the use of practices that consume water (e.g., practices with a permanent pool of water).
- Set specific goals for rainwater harvesting in the sizing criteria.
- Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in rainwater harvesting systems.
- The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
- Some plants on the landscaping list should be tolerant to periods of prolonged drought.
- Some plants on the landscaping list should be fire-resistant.
- Bioretention design should incorporate internal water storage.

Sea Level Rise

No Recommendations

Temperature

- Add a section that discusses climate change and recommends specific adaptation measures.
- Incorporate specific vegetation targets and/or a tree planting credit into standards.
- Some plants on the landscaping list should provide shading or cooling.
- The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
- Select light colors for BMP materials such as permeable pavement to provide solar reflection.
- Incorporate temperature-resistance standards into BMP materials such as permeable pavement mixes.
- Consider the carbon footprint of BMP materials.
- Modify existing water quality sizing to consider downstream ecology and quality.

Complete List of Recommendations by Category for Arkansas

Modern Manual

- Develop a state stormwater manual.
- Revise standards to incorporate specific guidance for designing and selecting stormwater BMPs.
- Include a list of specific stormwater BMPs that are acceptable to meet standards.
- Incorporate channel protection sizing into existing standards
- Adopt specific numeric runoff reduction and water quality sizing standards.
- Update design storms to reference the most recent available storm data.
- Guidance should include Green Infrastructure practices.
- Require Green Infrastructure practices either explicitly or as a means of achieving a goal such as runoff reduction.
- Require designers to consider site design features that minimize impervious cover and protect critical natural areas (Low Impact Development)
- Incorporate specific vegetation targets and/or a tree planting credit into standards.

High Precipitation

- Add a section that discusses climate change and recommends specific adaptation measures.
- For water quantity sizing, incorporate projected storm data or other options that account for increased storm depths due to climate change.
- Incorporate storms by reference rather than including maps or static images in standards.
- Enhance quantity sizing standards to consider historic flooding and downstream conditions.
- If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
- Provide a factor of safety when conveying the water quality storm, either by modeling a high-intensity storm or providing supplemental freeboard.
- Consider future floodplain extent when identifying potential locations for stormwater BMPs.
- Incorporate additional space around BMPs to provide a right of way for large, intense storms.
- Increase the ponding depth for filtering systems and bioretention to prevent bypass of high intensity storm events.
- If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.

Drought

- Add a section that discusses climate change and recommends specific adaptation measures.
- Incorporate specific guidance for sizing rainwater harvesting systems.
- Modify existing water quality sizing to consider downstream ecology and quality.
- Prohibit or restrict the use of practices that consume water (e.g., practices with a permanent pool of water).
- Set specific goals for rainwater harvesting in the sizing criteria.
- Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in rainwater harvesting systems.
- The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
- Some plants on the landscaping list should be tolerant to periods of prolonged drought.
- Some plants on the landscaping list should be fire-resistant.
- Bioretention design should incorporate internal water storage.

Sea Level Rise

No Recommendations

Temperature

- Add a section that discusses climate change and recommends specific adaptation measures.
- Incorporate specific vegetation targets and/or a tree planting credit into standards.
- Some plants on the landscaping list should provide shading or cooling.
- The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
- Select light colors for BMP materials such as permeable pavement to provide solar reflection.
- Incorporate temperature-resistance standards into BMP materials such as permeable pavement mixes.
- Consider the carbon footprint of BMP materials.
- Modify existing water quality sizing to consider downstream ecology and quality.

Complete List of Recommendations by Category for California

Modern Manual

• Incorporate specific vegetation targets and/or a tree planting credit into standards.
• Ensure that practices are resistant to erosion. Methods include prescribing non-erosive storm events, providing detention at the inlet, or designing practices off-line.
• Incorporate a landscaping list into design standards.
• Standards should identify a specific ponding depth for filtering systems and bioretention.
• Bioretention designs should incorporate internal water storage.

High Precipitation

• Add a section that discusses climate change and recommends specific adaptation measures.
• For water quantity sizing, incorporate projected storm data or other options that account for increased storm depths due to climate change.
• Revise stormwater quantity sizing to either over-control the storm event or match a historical peak discharge.
• If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
• Provide a factor of safety when conveying the water quality storm, either by modeling a high-intensity storm or providing supplemental freeboard.
• Consider future floodplain extent when identifying potential locations for stormwater BMPs.
• Incorporate additional space around BMPs to provide a right of way for large, intense storms.
• Increase the ponding depth for filtering systems and bioretention to prevent bypass of high intensity storm events.
• If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.
• Incorporate Smart BMP Technology into standards and provide recommendations for its use in adapting to changing storm patterns.

Drought

• Add a section that discusses climate change and recommends specific adaptation measures.
• Prohibit or restrict the use of practices that consume water (e.g., practices with a permanent pool of water).
• Set specific goals for rainwater harvesting in the sizing criteria.
• Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in rainwater harvesting systems.
• Some plants on the landscaping list should be tolerant to periods of prolonged drought.
• Some plants on the landscaping list should be fire-resistant.
• Bioretention design should incorporate internal water storage.
• Consider adding polymers designed to retain soil moisture to bioretention specifications.
• Consider incorporating biochar into filter media standards.
• Consider the carbon footprint of BMP materials.

Sea Level Rise

• Add a section that discusses climate change and recommends specific adaptation measures.
• The climate change section should incorporate sea level rise.
• Incorporate sizing standards adapted to sea level rise in coastal regions.
• Consider salt water intrusion and sea level rise when siting stormwater BMPs.
• Consider future floodplain extent when identifying potential locations for stormwater BMPs.
• Revise stormwater BMP siting standards to incorporate sea level rise.
• Elevate outfall inverts to the level of the projected high tide.
• Incorporate check valves to prevent backup at outlet pipes.
• Incorporate features that allow for future practice modification as climate changes.
• Oversize pipes or open channels to account for lost storage from rising sea levels.

Temperature

• Add a section that discusses climate change and recommends specific adaptation measures.
• Incorporate specific vegetation targets and/or a tree planting credit into standards.
• Some plants on the landscaping list should provide shading or cooling.
• Select light colors for BMP materials such as permeable pavement to provide solar reflection.
• Incorporate temperature-resistance standards into BMP materials such as permeable pavement mixes.
• Consider the carbon footprint of BMP materials.

Complete List of Recommendations by Category for Colorado

Modern Manual

• Develop a state stormwater manual.
• Include a list of specific stormwater BMPs that are acceptable to meet standards.
• Apply standards statewide.
• Reduce the disturbance threshold to less than 1 acre.
• Incorporate channel protection sizing into existing standards
• Adopt specific numeric runoff reduction and water quality sizing standards.
• Update design storms to reference the most recent available storm data.
• Guidance should include Green Infrastructure practices.
• Require Green Infrastructure practices either explicitly or as a means of achieving a goal such as runoff reduction.
• Incorporate specific vegetation targets and/or a tree planting credit into standards.

High Precipitation

• Add a section that discusses climate change and recommends specific adaptation measures.
• For water quantity sizing, incorporate projected storm data or other options that account for increased storm depths due to climate change.
• Incorporate storms by reference rather than including maps or static images in standards.
• If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
• Provide a factor of safety when conveying the water quality storm, either by modeling a high-intensity storm or providing supplemental freeboard.
• Consider future floodplain extent when identifying potential locations for stormwater BMPs.
• Incorporate additional space around BMPs to provide a right of way for large, intense storms.
• Increase the ponding depth for filtering systems and bioretention to prevent bypass of high intensity storm events.
• If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.
• Incorporate Smart BMP Technology into standards and provide recommendations for its use in adapting to changing storm patterns.

Drought

• Add a section that discusses climate change and recommends specific adaptation measures.
• Incorporate specific guidance for sizing rainwater harvesting systems.
• Modify existing water quality sizing to consider downstream ecology and quality.
• Prohibit or restrict the use of practices that consume water (e.g., practices with a permanent pool of water).
• Set specific goals for rainwater harvesting in the sizing criteria.
• Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in rainwater harvesting systems.
• The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
• Some plants on the landscaping list should be tolerant to periods of prolonged drought.
• Some plants on the landscaping list should be fire-resistant.
• Bioretention design should incorporate internal water storage.

Sea Level Rise

No Recommendations

Temperature

• Add a section that discusses climate change and recommends specific adaptation measures.
• Incorporate specific vegetation targets and/or a tree planting credit into standards.
• Some plants on the landscaping list should provide shading or cooling.
• The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
• Select light colors for BMP materials such as permeable pavement to provide solar reflection.
• Incorporate temperature-resistance standards into BMP materials such as permeable pavement mixes.
• Consider the carbon footprint of BMP materials.
• Modify existing water quality sizing to consider downstream ecology and quality.

Complete List of Recommendations by Category for Connecticut

Modern Manual

- Revise standards to incorporate specific guidance for designing and selecting stormwater BMPs.
- Incorporate specific vegetation targets and/or a tree planting credit into standards.
- Ensure that practices are resistant to erosion. Methods include prescribing non-erosive storm events, providing detention at the inlet, or designing practices off-line.
- Standards should identify a specific ponding depth for filtering systems and bioretention.

High Precipitation

- For water quantity sizing, incorporate projected storm data or other options that account for increased storm depths due to climate change.
- Revise stormwater quantity sizing to either over-control the storm event or match a historical peak discharge.
- Enhance quantity sizing standards to consider historic flooding and downstream conditions.
- If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
- Consider increasing the water quality storm depth to capture greater annual runoff volume.
- Provide a factor of safety when conveying the water quality storm, either by modeling a high-intensity storm or providing supplemental freeboard.
- Consider future floodplain extent when identifying potential locations for stormwater BMPs.
- Incorporate additional space around BMPs to provide a right of way for large, intense storms.
- Increase the ponding depth for filtering systems and bioretention to prevent bypass of high intensity storm events.
- If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.

Drought

- Incorporate specific guidance for sizing rainwater harvesting systems.
- Modify existing water quality sizing to consider downstream ecology and quality.
- Prohibit or restrict the use of practices that consume water (e.g., practices with a permanent pool of water).
- Set specific goals for rainwater harvesting in the sizing criteria.
- Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in rainwater harvesting systems.
- The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
- Some plants on the landscaping list should be fire-resistant.
- Consider adding polymers designed to retain soil moisture to bioretention specifications.
- Consider the carbon footprint of BMP materials.

Sea Level Rise

- Incorporate sizing standards adapted to sea level rise in coastal regions.
- Consider future floodplain extent when identifying potential locations for stormwater BMPs.
- Revise stormwater BMP siting standards to incorporate sea level rise.
- Elevate outfall inverts to the level of the projected high tide.
- Incorporate check valves to prevent backup at outlet pipes.
- Incorporate features that allow for future practice modification as climate changes.
- Oversize pipes or open channels to account for lost storage from rising sea levels.
- Incorporate pumps or other features provide increased head during high tide into the conveyance system.
- Consider corrosion-resistance when selecting BMP materials.
- Revise standards to incorporate a reserve area or future practice expansion to accommodate sea level rise.

Temperature

- Incorporate specific vegetation targets and/or a tree planting credit into standards.
- The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
- Select light colors for BMP materials such as permeable pavement to provide solar reflection.
- Incorporate temperature-resistance standards into BMP materials such as permeable pavement mixes.
- Consider the carbon footprint of BMP materials.
- Modify existing water quality sizing to consider downstream ecology and quality.

Complete List of Recommendations by Category for Delaware

Modern Manual

- Update design storms to reference the most recent available storm data.
- Require designers to consider site design features that minimize impervious cover and protect critical natural areas (Low Impact Development)
- Incorporate specific vegetation targets and/or a tree planting credit into standards.
- Standards should identify a specific ponding depth for filtering systems and bioretention.
- Bioretention designs should incorporate internal water storage.

High Precipitation

- Add a section that discusses climate change and recommends specific adaptation measures.
- For water quantity sizing, incorporate projected storm data or other options that account for increased storm depths due to climate change.
- Incorporate storms by reference rather than including maps or static images in standards.
- Revise stormwater quantity sizing to either over-control the storm event or match a historical peak discharge.
- Enhance quantity sizing standards to consider historic flooding and downstream conditions.
- If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
- Provide a factor of safety when conveying the water quality storm, either by modeling a high-intensity storm or providing supplemental freeboard.
- Consider future floodplain extent when identifying potential locations for stormwater BMPs.
- Incorporate additional space around BMPs to provide a right of way for large, intense storms.
- Increase the ponding depth for filtering systems and bioretention to prevent bypass of high intensity storm events.

Drought

- Add a section that discusses climate change and recommends specific adaptation measures.
- Modify existing water quality sizing to consider downstream ecology and quality.
- Prohibit or restrict the use of practices that consume water (e.g., practices with a permanent pool of water).
- Set specific goals for rainwater harvesting in the sizing criteria.
- Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in rainwater harvesting systems.
- The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
- Some plants on the landscaping list should be fire-resistant.
- Bioretention design should incorporate internal water storage.
- Consider adding polymers designed to retain soil moisture to bioretention specifications.
- Consider incorporating biochar into filter media standards.

Sea Level Rise

- Add a section that discusses climate change and recommends specific adaptation measures.
- The climate change section should incorporate sea level rise.
- Consider salt water intrusion and sea level rise when siting stormwater BMPs.
- Consider future floodplain extent when identifying potential locations for stormwater BMPs.
- Revise stormwater BMP siting standards to incorporate sea level rise.
- Elevate outfall inverts to the level of the projected high tide.
- Incorporate check valves to prevent backup at outlet pipes.
- Incorporate features that allow for future practice modification as climate changes.
- Oversize pipes or open channels to account for lost storage from rising sea levels.
- Incorporate pumps or other features provide increased head during high tide into the conveyance system.

Temperature

- Add a section that discusses climate change and recommends specific adaptation measures.
- Incorporate specific vegetation targets and/or a tree planting credit into standards.
- Some plants on the landscaping list should provide shading or cooling.
- The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
- Select light colors for BMP materials such as permeable pavement to provide solar reflection.
- Incorporate temperature-resistance standards into BMP materials such as permeable pavement mixes.
- Consider the carbon footprint of BMP materials.
- Modify existing water quality sizing to consider downstream ecology and quality.

Complete List of Recommendations by Category for District_of_Columbia

Modern Manual

• Ensure that practices are resistant to erosion. Methods include prescribing non-erosive storm events, providing detention at the inlet, or designing practices off-line.

High Precipitation

• Add a section that discusses climate change and recommends specific adaptation measures.
• For water quantity sizing, incorporate projected storm data or other options that account for increased storm depths due to climate change.
• Revise stormwater quantity sizing to either over-control the storm event or match a historical peak discharge.
• Enhance quantity sizing standards to consider historic flooding and downstream conditions.
• If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
• Consider increasing the water quality storm depth to capture greater annual runoff volume.
• Incorporate additional space around BMPs to provide a right of way for large, intense storms.
• Increase the ponding depth for filtering systems and bioretention to prevent bypass of high intensity storm events.
• If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.
• Incorporate Smart BMP Technology into standards and provide recommendations for its use in adapting to changing storm patterns.

Drought

• Add a section that discusses climate change and recommends specific adaptation measures.
• Prohibit or restrict the use of practices that consume water (e.g., practices with a permanent pool of water).
• Set specific goals for rainwater harvesting in the sizing criteria.
• Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in rainwater harvesting systems.
• The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
• Some plants on the landscaping list should be fire-resistant.
• Consider adding polymers designed to retain soil moisture to bioretention specifications.
• Consider incorporating biochar into filter media standards.
• Consider the carbon footprint of BMP materials.

Sea Level Rise

• Add a section that discusses climate change and recommends specific adaptation measures.
• The climate change section should incorporate sea level rise.
• Incorporate sizing standards adapted to sea level rise in coastal regions.
• Consider salt water intrusion and sea level rise when siting stormwater BMPs.
• Revise stormwater BMP siting standards to incorporate sea level rise.
• Elevate outfall inverts to the level of the projected high tide.
• Incorporate features that allow for future practice modification as climate changes.
• Oversize pipes or open channels to account for lost storage from rising sea levels.
• Consider corrosion-resistance when selecting BMP materials.
• Revise standards to incorporate a reserve area or future practice expansion to accommodate sea level rise.

Temperature

• Add a section that discusses climate change and recommends specific adaptation measures.
• Some plants on the landscaping list should provide shading or cooling.
• The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
• Select light colors for BMP materials such as permeable pavement to provide solar reflection.
• Incorporate temperature-resistance standards into BMP materials such as permeable pavement mixes.
• Consider the carbon footprint of BMP materials.

Complete List of Recommendations by Category for Florida

Modern Manual

- Adopt specific numeric runoff reduction and water quality sizing standards.
- Update design storms to reference the most recent available storm data.
- Guidance should include Green Infrastructure practices.
- Require Green Infrastructure practices either explicitly or as a means of achieving a goal such as runoff reduction.
- Require designers to consider site design features that minimize impervious cover and protect critical natural areas (Low Impact Development)
- Incorporate specific vegetation targets and/or a tree planting credit into standards.
- Incorporate preatreatment into design standards.
- Ensure that practices are resistant to erosion. Methods include prescribing non-erosive storm events, providing detention at the inlet, or designing practices off-line.
- Incorporate a landscaping list into design standards.
- Provide filter media guidance to prevent clogging and ensure permeability.

High Precipitation

- Add a section that discusses climate change and recommends specific adaptation measures.
- For water quantity sizing, incorporate projected storm data or other options that account for increased storm depths due to climate change.
- Incorporate storms by reference rather than including maps or static images in standards.
- Revise stormwater quantity sizing to either over-control the storm event or match a historical peak discharge.
- Enhance quantity sizing standards to consider historic flooding and downstream conditions.
- If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
- Provide a factor of safety when conveying the water quality storm, either by modeling a high-intensity storm or providing supplemental freeboard.
- Consider future floodplain extent when identifying potential locations for stormwater BMPs.
- Incorporate additional space around BMPs to provide a right of way for large, intense storms.
- Increase the ponding depth for filtering systems and bioretention to prevent bypass of high intensity storm events.

Drought

- Add a section that discusses climate change and recommends specific adaptation measures.
- Modify existing water quality sizing to consider downstream ecology and quality.
- Prohibit or restrict the use of practices that consume water (e.g., practices with a permanent pool of water).
- Set specific goals for rainwater harvesting in the sizing criteria.
- Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in rainwater harvesting systems.
- The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
- Some plants on the landscaping list should be tolerant to periods of prolonged drought.
- Some plants on the landscaping list should be fire-resistant.
- Bioretention design should incorporate internal water storage.
- Consider adding polymers designed to retain soil moisture to bioretention specifications.

Sea Level Rise

- Add a section that discusses climate change and recommends specific adaptation measures.
- The climate change section should incorporate sea level rise.
- Consider salt water intrusion and sea level rise when siting stormwater BMPs.
- Consider future floodplain extent when identifying potential locations for stormwater BMPs.
- Revise stormwater BMP siting standards to incorporate sea level rise.
- Elevate outfall inverts to the level of the projected high tide.
- Incorporate check valves to prevent backup at outlet pipes.
- Incorporate features that allow for future practice modification as climate changes.
- Oversize pipes or open channels to account for lost storage from rising sea levels.
- Incorporate pumps or other features provide increased head during high tide into the conveyance system.

Temperature

- Add a section that discusses climate change and recommends specific adaptation measures.
- Incorporate specific vegetation targets and/or a tree planting credit into standards.
- Some plants on the landscaping list should provide shading or cooling.
- The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
- Select light colors for BMP materials such as permeable pavement to provide solar reflection.
- Incorporate temperature-resistance standards into BMP materials such as permeable pavement mixes.
- Consider the carbon footprint of BMP materials.
- Modify existing water quality sizing to consider downstream ecology and quality.

Complete List of Recommendations by Category for Georgia

Modern Manual

- Apply standards statewide.
- Reduce the disturbance threshold to less than 1 acre.
- Incorporate specific vegetation targets and/or a tree planting credit into standards.

High Precipitation

- For water quantity sizing, incorporate projected storm data or other options that account for increased storm depths due to climate change.
- Revise stormwater quantity sizing to either over-control the storm event or match a historical peak discharge.
- Enhance quantity sizing standards to consider historic flooding and downstream conditions.
- If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
- Consider increasing the water quality storm depth to capture greater annual runoff volume.
- Provide a factor of safety when conveying the water quality storm, either by modeling a high-intensity storm or providing supplemental freeboard.
- Incorporate additional space around BMPs to provide a right of way for large, intense storms.
- Increase the ponding depth for filtering systems and bioretention to prevent bypass of high intensity storm events.
- If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.
- Incorporate Smart BMP Technology into standards and provide recommendations for its use in adapting to changing storm patterns.

Drought

- Modify existing water quality sizing to consider downstream ecology and quality.
- Prohibit or restrict the use of practices that consume water (e.g., practices with a permanent pool of water).
- Set specific goals for rainwater harvesting in the sizing criteria.
- Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in rainwater harvesting systems.
- Some plants on the landscaping list should be fire-resistant.
- Consider adding polymers designed to retain soil moisture to bioretention specifications.
- Consider incorporating biochar into filter media standards.
- Consider the carbon footprint of BMP materials.

Sea Level Rise

- Incorporate sizing standards adapted to sea level rise in coastal regions.
- Consider salt water intrusion and sea level rise when siting stormwater BMPs.
- Revise stormwater BMP siting standards to incorporate sea level rise.
- Incorporate check valves to prevent backup at outlet pipes.
- Incorporate features that allow for future practice modification as climate changes.
- Oversize pipes or open channels to account for lost storage from rising sea levels.
- Incorporate pumps or other features provide increased head during high tide into the conveyance system.
- Consider corrosion-resistance when selecting BMP materials.
- Revise standards to incorporate a reserve area or future practice expansion to accommodate sea level rise.
- Some plants on the landscaping list should tolerate to "wet feet" and frequent inundation.

Temperature

- Incorporate specific vegetation targets and/or a tree planting credit into standards.
- Some plants on the landscaping list should provide shading or cooling.
- Select light colors for BMP materials such as permeable pavement to provide solar reflection.
- Incorporate temperature-resistance standards into BMP materials such as permeable pavement mixes.
- Consider the carbon footprint of BMP materials.
- Modify existing water quality sizing to consider downstream ecology and quality.

Complete List of Recommendations by Category for Hawaii

Modern Manual

- Develop a state stormwater manual.
- Apply standards statewide.
- Reduce the disturbance threshold to less than 1 acre.
- Incorporate channel protection sizing into existing standards
- Adopt specific numeric runoff reduction and water quality sizing standards.
- Update design storms to reference the most recent available storm data.
- Require Green Infrastructure practices either explicitly or as a means of achieving a goal such as runoff reduction.
- Require designers to consider site design features that minimize impervious cover and protect critical natural areas (Low Impact Development)
- Incorporate specific vegetation targets and/or a tree planting credit into standards.
- Develop a maintenance checklist to guide maintenance activities.

High Precipitation

- Add a section that discusses climate change and recommends specific adaptation measures.
- For water quantity sizing, incorporate projected storm data or other options that account for increased storm depths due to climate change.
- Incorporate storms by reference rather than including maps or static images in standards.
- If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
- Provide a factor of safety when conveying the water quality storm, either by modeling a high-intensity storm or providing supplemental freeboard.
- Consider future floodplain extent when identifying potential locations for stormwater BMPs.
- Incorporate additional space around BMPs to provide a right of way for large, intense storms.
- Increase the ponding depth for filtering systems and bioretention to prevent bypass of high intensity storm events.
- If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.
- Incorporate Smart BMP Technology into standards and provide recommendations for its use in adapting to changing storm patterns.

Drought

- Add a section that discusses climate change and recommends specific adaptation measures.
- Modify existing water quality sizing to consider downstream ecology and quality.
- Prohibit or restrict the use of practices that consume water (e.g., practices with a permanent pool of water).
- Set specific goals for rainwater harvesting in the sizing criteria.
- Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in rainwater harvesting systems.
- Some plants on the landscaping list should be tolerant to periods of prolonged drought.
- Some plants on the landscaping list should be fire-resistant.
- Bioretention design should incorporate internal water storage.
- Consider adding polymers designed to retain soil moisture to bioretention specifications.
- Consider incorporating biochar into filter media standards.

Sea Level Rise

- Add a section that discusses climate change and recommends specific adaptation measures.
- The climate change section should incorporate sea level rise.
- Incorporate sizing standards adapted to sea level rise in coastal regions.
- Consider salt water intrusion and sea level rise when siting stormwater BMPs.
- Consider future floodplain extent when identifying potential locations for stormwater BMPs.
- Revise stormwater BMP siting standards to incorporate sea level rise.
- Elevate outfall inverts to the level of the projected high tide.
- Incorporate check valves to prevent backup at outlet pipes.
- Incorporate features that allow for future practice modification as climate changes.
- Oversize pipes or open channels to account for lost storage from rising sea levels.

Temperature

- Add a section that discusses climate change and recommends specific adaptation measures.
- Incorporate specific vegetation targets and/or a tree planting credit into standards.
- Some plants on the landscaping list should provide shading or cooling.
- Select light colors for BMP materials such as permeable pavement to provide solar reflection.
- Incorporate temperature-resistance standards into BMP materials such as permeable pavement mixes.
- Consider the carbon footprint of BMP materials.
- Modify existing water quality sizing to consider downstream ecology and quality.

Complete List of Recommendations by Category for Idaho

Modern Manual

• Apply standards statewide.
• Reduce the disturbance threshold to less than 1 acre.
• Adopt specific numeric runoff reduction and water quality sizing standards.
• Update design storms to reference the most recent available storm data.
• Guidance should include Green Infrastructure practices.
• Require Green Infrastructure practices either explicitly or as a means of achieving a goal such as runoff reduction.
• Incorporate specific vegetation targets and/or a tree planting credit into standards.
• Incorporate preatreatment into design standards.
• Ensure that practices are resistant to erosion. Methods include prescribing non-erosive storm events, providing detention at the inlet, or designing practices off-line.
• Incorporate a landscaping list into design standards.

High Precipitation

• Add a section that discusses climate change and recommends specific adaptation measures.
• For water quantity sizing, incorporate projected storm data or other options that account for increased storm depths due to climate change.
• Incorporate storms by reference rather than including maps or static images in standards.
• Enhance quantity sizing standards to consider historic flooding and downstream conditions.
• If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
• Provide a factor of safety when conveying the water quality storm, either by modeling a high-intensity storm or providing supplemental freeboard.
• Consider future floodplain extent when identifying potential locations for stormwater BMPs.
• Incorporate additional space around BMPs to provide a right of way for large, intense storms.
• Increase the ponding depth for filtering systems and bioretention to prevent bypass of high intensity storm events.
• If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.

Drought

• Add a section that discusses climate change and recommends specific adaptation measures.
• Incorporate specific guidance for sizing rainwater harvesting systems.
• Modify existing water quality sizing to consider downstream ecology and quality.
• Prohibit or restrict the use of practices that consume water (e.g., practices with a permanent pool of water).
• Set specific goals for rainwater harvesting in the sizing criteria.
• Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in rainwater harvesting systems.
• The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
• Some plants on the landscaping list should be tolerant to periods of prolonged drought.
• Some plants on the landscaping list should be fire-resistant.
• Bioretention design should incorporate internal water storage.

Sea Level Rise

No Recommendations

Temperature

• Add a section that discusses climate change and recommends specific adaptation measures.
• Incorporate specific vegetation targets and/or a tree planting credit into standards.
• Some plants on the landscaping list should provide shading or cooling.
• The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
• Select light colors for BMP materials such as permeable pavement to provide solar reflection.
• Incorporate temperature-resistance standards into BMP materials such as permeable pavement mixes.
• Consider the carbon footprint of BMP materials.
• Modify existing water quality sizing to consider downstream ecology and quality.

Complete List of Recommendations by Category for Illinois

Modern Manual

- Apply standards statewide.
- Reduce the disturbance threshold to less than 1 acre.
- Incorporate channel protection sizing into existing standards
- Adopt specific numeric runoff reduction and water quality sizing standards.
- Update design storms to reference the most recent available storm data.
- Require Green Infrastructure practices either explicitly or as a means of achieving a goal such as runoff reduction.
- Ensure that practices are resistant to erosion. Methods include prescribing non-erosive storm events, providing detention at the inlet, or designing practices off-line.
- Standards should identify a specific ponding depth for filtering systems and bioretention.
- Bioretention designs should incorporate internal water storage.

High Precipitation

- Add a section that discusses climate change and recommends specific adaptation measures.
- For water quantity sizing, incorporate projected storm data or other options that account for increased storm depths due to climate change.
- Incorporate storms by reference rather than including maps or static images in standards.
- Enhance quantity sizing standards to consider historic flooding and downstream conditions.
- If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
- Provide a factor of safety when conveying the water quality storm, either by modeling a high-intensity storm or providing supplemental freeboard.
- Consider future floodplain extent when identifying potential locations for stormwater BMPs.
- Incorporate additional space around BMPs to provide a right of way for large, intense storms.
- Increase the ponding depth for filtering systems and bioretention to prevent bypass of high intensity storm events.
- If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.

Drought

- Add a section that discusses climate change and recommends specific adaptation measures.
- Incorporate specific guidance for sizing rainwater harvesting systems.
- Modify existing water quality sizing to consider downstream ecology and quality.
- Prohibit or restrict the use of practices that consume water (e.g., practices with a permanent pool of water).
- Set specific goals for rainwater harvesting in the sizing criteria.
- Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in rainwater harvesting systems.
- The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
- Some plants on the landscaping list should be tolerant to periods of prolonged drought.
- Some plants on the landscaping list should be fire-resistant.
- Bioretention design should incorporate internal water storage.

Sea Level Rise

No Recommendations

Temperature

- Add a section that discusses climate change and recommends specific adaptation measures.
- Some plants on the landscaping list should provide shading or cooling.
- The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
- Select light colors for BMP materials such as permeable pavement to provide solar reflection.
- Incorporate temperature-resistance standards into BMP materials such as permeable pavement mixes.
- Consider the carbon footprint of BMP materials.
- Modify existing water quality sizing to consider downstream ecology and quality.

Complete List of Recommendations by Category for Indiana

Modern Manual

- Review and update existing design standards.
- Apply standards statewide.
- Reduce the disturbance threshold to less than 1 acre.
- Incorporate channel protection sizing into existing standards
- Adopt specific numeric runoff reduction and water quality sizing standards.
- Update design storms to reference the most recent available storm data.
- Require Green Infrastructure practices either explicitly or as a means of achieving a goal such as runoff reduction.
- Incorporate specific vegetation targets and/or a tree planting credit into standards.
- Ensure that practices are resistant to erosion. Methods include prescribing non-erosive storm events, providing detention at the inlet, or designing practices off-line.
- Provide filter media guidance to prevent clogging and ensure permeability.

High Precipitation

- Add a section that discusses climate change and recommends specific adaptation measures.
- For water quantity sizing, incorporate projected storm data or other options that account for increased storm depths due to climate change.
- Incorporate storms by reference rather than including maps or static images in standards.
- Revise stormwater quantity sizing to either over-control the storm event or match a historical peak discharge.
- Enhance quantity sizing standards to consider historic flooding and downstream conditions.
- If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
- Provide a factor of safety when conveying the water quality storm, either by modeling a high-intensity storm or providing supplemental freeboard.
- Consider future floodplain extent when identifying potential locations for stormwater BMPs.
- Incorporate additional space around BMPs to provide a right of way for large, intense storms.
- Increase the ponding depth for filtering systems and bioretention to prevent bypass of high intensity storm events.

Drought

- Add a section that discusses climate change and recommends specific adaptation measures.
- Incorporate specific guidance for sizing rainwater harvesting systems.
- Modify existing water quality sizing to consider downstream ecology and quality.
- Prohibit or restrict the use of practices that consume water (e.g., practices with a permanent pool of water).
- Set specific goals for rainwater harvesting in the sizing criteria.
- Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in rainwater harvesting systems.
- The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
- Some plants on the landscaping list should be tolerant to periods of prolonged drought.
- Some plants on the landscaping list should be fire-resistant.
- Bioretention design should incorporate internal water storage.

Sea Level Rise

No Recommendations

Temperature

- Add a section that discusses climate change and recommends specific adaptation measures.
- Incorporate specific vegetation targets and/or a tree planting credit into standards.
- Some plants on the landscaping list should provide shading or cooling.
- The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
- Select light colors for BMP materials such as permeable pavement to provide solar reflection.
- Incorporate temperature-resistance standards into BMP materials such as permeable pavement mixes.
- Consider the carbon footprint of BMP materials.
- Modify existing water quality sizing to consider downstream ecology and quality.

Complete List of Recommendations by Category for Iowa

Modern Manual

• Apply standards statewide.
• Guidance should include Green Infrastructure practices.
• Incorporate specific vegetation targets and/or a tree planting credit into standards.
• Develop a maintenance checklist to guide maintenance activities.
• Standards should identify a specific ponding depth for filtering systems and bioretention.

High Precipitation

• Add a section that discusses climate change and recommends specific adaptation measures.
• For water quantity sizing, incorporate projected storm data or other options that account for increased storm depths due to climate change.
• Revise stormwater quantity sizing to either over-control the storm event or match a historical peak discharge.
• Provide a factor of safety when conveying the water quality storm, either by modeling a high-intensity storm or providing supplemental freeboard.
• Consider future floodplain extent when identifying potential locations for stormwater BMPs.
• Incorporate additional space around BMPs to provide a right of way for large, intense storms.
• Increase the ponding depth for filtering systems and bioretention to prevent bypass of high intensity storm events.
• If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.
• Incorporate Smart BMP Technology into standards and provide recommendations for its use in adapting to changing storm patterns.
• Some plants on the landscaping list should tolerate to "wet feet" and frequent inundation.

Drought

• Add a section that discusses climate change and recommends specific adaptation measures.
• Incorporate specific guidance for sizing rainwater harvesting systems.
• Modify existing water quality sizing to consider downstream ecology and quality.
• Prohibit or restrict the use of practices that consume water (e.g., practices with a permanent pool of water).
• Set specific goals for rainwater harvesting in the sizing criteria.
• Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in rainwater harvesting systems.
• The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
• Some plants on the landscaping list should be tolerant to periods of prolonged drought.
• Some plants on the landscaping list should be fire-resistant.
• Consider incorporating biochar into filter media standards.

Sea Level Rise

No Recommendations

Temperature

• Add a section that discusses climate change and recommends specific adaptation measures.
• Incorporate specific vegetation targets and/or a tree planting credit into standards.
• Some plants on the landscaping list should provide shading or cooling.
• The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
• Select light colors for BMP materials such as permeable pavement to provide solar reflection.
• Incorporate temperature-resistance standards into BMP materials such as permeable pavement mixes.
• Consider the carbon footprint of BMP materials.
• Modify existing water quality sizing to consider downstream ecology and quality.

Complete List of Recommendations by Category for Kansas

Modern Manual

- Develop a state stormwater manual.
- Revise standards to incorporate specific guidance for designing and selecting stormwater BMPs.
- Include a list of specific stormwater BMPs that are acceptable to meet standards.
- Apply standards statewide.
- Reduce the disturbance threshold to less than 1 acre.
- Incorporate channel protection sizing into existing standards
- Adopt specific numeric runoff reduction and water quality sizing standards.
- Update design storms to reference the most recent available storm data.
- Guidance should include Green Infrastructure practices.
- Require Green Infrastructure practices either explicitly or as a means of achieving a goal such as runoff reduction.

High Precipitation

- Add a section that discusses climate change and recommends specific adaptation measures.
- For water quantity sizing, incorporate projected storm data or other options that account for increased storm depths due to climate change.
- Incorporate storms by reference rather than including maps or static images in standards.
- Enhance quantity sizing standards to consider historic flooding and downstream conditions.
- If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
- Provide a factor of safety when conveying the water quality storm, either by modeling a high-intensity storm or providing supplemental freeboard.
- Consider future floodplain extent when identifying potential locations for stormwater BMPs.
- Incorporate additional space around BMPs to provide a right of way for large, intense storms.
- Increase the ponding depth for filtering systems and bioretention to prevent bypass of high intensity storm events.
- If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.

Drought

- Add a section that discusses climate change and recommends specific adaptation measures.
- Incorporate specific guidance for sizing rainwater harvesting systems.
- Modify existing water quality sizing to consider downstream ecology and quality.
- Prohibit or restrict the use of practices that consume water (e.g., practices with a permanent pool of water).
- Set specific goals for rainwater harvesting in the sizing criteria.
- Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in rainwater harvesting systems.
- The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
- Some plants on the landscaping list should be tolerant to periods of prolonged drought.
- Some plants on the landscaping list should be fire-resistant.
- Bioretention design should incorporate internal water storage.

Sea Level Rise

No Recommendations

Temperature

- Add a section that discusses climate change and recommends specific adaptation measures.
- Incorporate specific vegetation targets and/or a tree planting credit into standards.
- Some plants on the landscaping list should provide shading or cooling.
- The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
- Select light colors for BMP materials such as permeable pavement to provide solar reflection.
- Incorporate temperature-resistance standards into BMP materials such as permeable pavement mixes.
- Consider the carbon footprint of BMP materials.
- Modify existing water quality sizing to consider downstream ecology and quality.

Complete List of Recommendations by Category for Kentucky

Modern Manual

• Develop a state stormwater manual.
• Revise standards to incorporate specific guidance for designing and selecting stormwater BMPs.
• Apply standards statewide.
• Reduce the disturbance threshold to less than 1 acre.
• Incorporate channel protection sizing into existing standards
• Adopt specific numeric runoff reduction and water quality sizing standards.
• Update design storms to reference the most recent available storm data.
• Require Green Infrastructure practices either explicitly or as a means of achieving a goal such as runoff reduction.
• Require designers to consider site design features that minimize impervious cover and protect critical natural areas (Low Impact Development)
• Incorporate specific vegetation targets and/or a tree planting credit into standards.

High Precipitation

• Add a section that discusses climate change and recommends specific adaptation measures.
• For water quantity sizing, incorporate projected storm data or other options that account for increased storm depths due to climate change.
• Incorporate storms by reference rather than including maps or static images in standards.
• If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
• Provide a factor of safety when conveying the water quality storm, either by modeling a high-intensity storm or providing supplemental freeboard.
• Consider future floodplain extent when identifying potential locations for stormwater BMPs.
• Incorporate additional space around BMPs to provide a right of way for large, intense storms.
• Increase the ponding depth for filtering systems and bioretention to prevent bypass of high intensity storm events.
• If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.
• Incorporate Smart BMP Technology into standards and provide recommendations for its use in adapting to changing storm patterns.

Drought

• Add a section that discusses climate change and recommends specific adaptation measures.
• Incorporate specific guidance for sizing rainwater harvesting systems.
• Modify existing water quality sizing to consider downstream ecology and quality.
• Prohibit or restrict the use of practices that consume water (e.g., practices with a permanent pool of water).
• Set specific goals for rainwater harvesting in the sizing criteria.
• Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in rainwater harvesting systems.
• The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
• Some plants on the landscaping list should be tolerant to periods of prolonged drought.
• Some plants on the landscaping list should be fire-resistant.
• Bioretention design should incorporate internal water storage.

Sea Level Rise

No Recommendations

Temperature

• Add a section that discusses climate change and recommends specific adaptation measures.
• Incorporate specific vegetation targets and/or a tree planting credit into standards.
• Some plants on the landscaping list should provide shading or cooling.
• The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
• Select light colors for BMP materials such as permeable pavement to provide solar reflection.
• Incorporate temperature-resistance standards into BMP materials such as permeable pavement mixes.
• Consider the carbon footprint of BMP materials.
• Modify existing water quality sizing to consider downstream ecology and quality.

Complete List of Recommendations by Category for Louisiana

Modern Manual

- Develop a state stormwater manual.
- Revise standards to incorporate specific guidance for designing and selecting stormwater BMPs.
- Include a list of specific stormwater BMPs that are acceptable to meet standards.
- Apply standards statewide.
- Reduce the disturbance threshold to less than 1 acre.
- Incorporate channel protection sizing into existing standards
- Adopt specific numeric runoff reduction and water quality sizing standards.
- Update design storms to reference the most recent available storm data.
- Guidance should include Green Infrastructure practices.
- Require Green Infrastructure practices either explicitly or as a means of achieving a goal such as runoff reduction.

High Precipitation

- Add a section that discusses climate change and recommends specific adaptation measures.
- For water quantity sizing, incorporate projected storm data or other options that account for increased storm depths due to climate change.
- Incorporate storms by reference rather than including maps or static images in standards.
- If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
- Provide a factor of safety when conveying the water quality storm, either by modeling a high-intensity storm or providing supplemental freeboard.
- Consider future floodplain extent when identifying potential locations for stormwater BMPs.
- Incorporate additional space around BMPs to provide a right of way for large, intense storms.
- Increase the ponding depth for filtering systems and bioretention to prevent bypass of high intensity storm events.
- If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.
- Incorporate Smart BMP Technology into standards and provide recommendations for its use in adapting to changing storm patterns.

Drought

- Add a section that discusses climate change and recommends specific adaptation measures.
- Incorporate specific guidance for sizing rainwater harvesting systems.
- Modify existing water quality sizing to consider downstream ecology and quality.
- Prohibit or restrict the use of practices that consume water (e.g., practices with a permanent pool of water).
- Set specific goals for rainwater harvesting in the sizing criteria.
- Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in rainwater harvesting systems.
- The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
- Some plants on the landscaping list should be tolerant to periods of prolonged drought.
- Some plants on the landscaping list should be fire-resistant.
- Bioretention design should incorporate internal water storage.

Sea Level Rise

- Add a section that discusses climate change and recommends specific adaptation measures.
- The climate change section should incorporate sea level rise.
- Incorporate sizing standards adapted to sea level rise in coastal regions.
- Consider salt water intrusion and sea level rise when siting stormwater BMPs.
- Consider future floodplain extent when identifying potential locations for stormwater BMPs.
- Revise stormwater BMP siting standards to incorporate sea level rise.
- Elevate outfall inverts to the level of the projected high tide.
- Incorporate check valves to prevent backup at outlet pipes.
- Incorporate features that allow for future practice modification as climate changes.
- Oversize pipes or open channels to account for lost storage from rising sea levels.

Temperature

- Add a section that discusses climate change and recommends specific adaptation measures.
- Incorporate specific vegetation targets and/or a tree planting credit into standards.
- Some plants on the landscaping list should provide shading or cooling.
- The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
- Select light colors for BMP materials such as permeable pavement to provide solar reflection.
- Incorporate temperature-resistance standards into BMP materials such as permeable pavement mixes.
- Consider the carbon footprint of BMP materials.
- Modify existing water quality sizing to consider downstream ecology and quality.

Complete List of Recommendations by Category for Maine

Modern Manual

• Reduce the disturbance threshold to less than 1 acre.
• Adopt specific numeric runoff reduction and water quality sizing standards.
• Require Green Infrastructure practices either explicitly or as a means of achieving a goal such as runoff reduction.
• Incorporate specific vegetation targets and/or a tree planting credit into standards.
• Develop a maintenance checklist to guide maintenance activities.
• Ensure that practices are resistant to erosion. Methods include prescribing non-erosive storm events, providing detention at the inlet, or designing practices off-line.
• Incorporate a landscaping list into design standards.
• Provide filter media guidance to prevent clogging and ensure permeability.
• Standards should identify a specific ponding depth for filtering systems and bioretention.
• Bioretention designs should incorporate internal water storage.

High Precipitation

• Add a section that discusses climate change and recommends specific adaptation measures.
• For water quantity sizing, incorporate projected storm data or other options that account for increased storm depths due to climate change.
• Revise stormwater quantity sizing to either over-control the storm event or match a historical peak discharge.
• If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
• Consider increasing the water quality storm depth to capture greater annual runoff volume.
• Provide a factor of safety when conveying the water quality storm, either by modeling a high-intensity storm or providing supplemental freeboard.
• Consider future floodplain extent when identifying potential locations for stormwater BMPs.
• Incorporate additional space around BMPs to provide a right of way for large, intense storms.
• Increase the ponding depth for filtering systems and bioretention to prevent bypass of high intensity storm events.
• If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.

Drought

• Add a section that discusses climate change and recommends specific adaptation measures.
• Incorporate specific guidance for sizing rainwater harvesting systems.
• Prohibit or restrict the use of practices that consume water (e.g., practices with a permanent pool of water).
• Set specific goals for rainwater harvesting in the sizing criteria.
• Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in rainwater harvesting systems.
• The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
• Some plants on the landscaping list should be tolerant to periods of prolonged drought.
• Some plants on the landscaping list should be fire-resistant.
• Bioretention design should incorporate internal water storage.
• Consider adding polymers designed to retain soil moisture to bioretention specifications.

Sea Level Rise

• Add a section that discusses climate change and recommends specific adaptation measures.
• The climate change section should incorporate sea level rise.
• Incorporate sizing standards adapted to sea level rise in coastal regions.
• Consider salt water intrusion and sea level rise when siting stormwater BMPs.
• Consider future floodplain extent when identifying potential locations for stormwater BMPs.
• Revise stormwater BMP siting standards to incorporate sea level rise.
• Elevate outfall inverts to the level of the projected high tide.
• Incorporate check valves to prevent backup at outlet pipes.
• Incorporate features that allow for future practice modification as climate changes.
• Oversize pipes or open channels to account for lost storage from rising sea levels.

Temperature

• Add a section that discusses climate change and recommends specific adaptation measures.
• Incorporate specific vegetation targets and/or a tree planting credit into standards.
• Some plants on the landscaping list should provide shading or cooling.
• The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
• Select light colors for BMP materials such as permeable pavement to provide solar reflection.
• Incorporate temperature-resistance standards into BMP materials such as permeable pavement mixes.
• Consider the carbon footprint of BMP materials.

Complete List of Recommendations by Category for Maryland

Modern Manual

- Review and update existing design standards.
- Update design storms to reference the most recent available storm data.
- Incorporate specific vegetation targets and/or a tree planting credit into standards.
- Bioretention designs should incorporate internal water storage.

High Precipitation

- Add a section that discusses climate change and recommends specific adaptation measures.
- For water quantity sizing, incorporate projected storm data or other options that account for increased storm depths due to climate change.
- Incorporate storms by reference rather than including maps or static images in standards.
- Revise stormwater quantity sizing to either over-control the storm event or match a historical peak discharge.
- Enhance quantity sizing standards to consider historic flooding and downstream conditions.
- If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
- Consider increasing the water quality storm depth to capture greater annual runoff volume.
- Provide a factor of safety when conveying the water quality storm, either by modeling a high-intensity storm or providing supplemental freeboard.
- Incorporate additional space around BMPs to provide a right of way for large, intense storms.
- Increase the ponding depth for filtering systems and bioretention to prevent bypass of high intensity storm events.

Drought

- Add a section that discusses climate change and recommends specific adaptation measures.
- Incorporate specific guidance for sizing rainwater harvesting systems.
- Prohibit or restrict the use of practices that consume water (e.g., practices with a permanent pool of water).
- Set specific goals for rainwater harvesting in the sizing criteria.
- Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in rainwater harvesting systems.
- The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
- Some plants on the landscaping list should be fire-resistant.
- Bioretention design should incorporate internal water storage.
- Consider adding polymers designed to retain soil moisture to bioretention specifications.
- Consider incorporating biochar into filter media standards.

Sea Level Rise

- Add a section that discusses climate change and recommends specific adaptation measures.
- The climate change section should incorporate sea level rise.
- Consider salt water intrusion and sea level rise when siting stormwater BMPs.
- Revise stormwater BMP siting standards to incorporate sea level rise.
- Incorporate features that allow for future practice modification as climate changes.
- Incorporate pumps or other features provide increased head during high tide into the conveyance system.
- Consider corrosion-resistance when selecting BMP materials.
- Revise standards to incorporate a reserve area or future practice expansion to accommodate sea level rise.
- The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
- Some plants on the landscaping list should tolerate to "wet feet" and frequent inundation.

Temperature

- Add a section that discusses climate change and recommends specific adaptation measures.
- Incorporate specific vegetation targets and/or a tree planting credit into standards.
- Some plants on the landscaping list should provide shading or cooling.
- The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
- Select light colors for BMP materials such as permeable pavement to provide solar reflection.
- Incorporate temperature-resistance standards into BMP materials such as permeable pavement mixes.
- Consider the carbon footprint of BMP materials.

Complete List of Recommendations by Category for Massachusetts

Modern Manual

- Review and update existing design standards.
- Incorporate channel protection sizing into existing standards
- Update design storms to reference the most recent available storm data.
- Incorporate specific vegetation targets and/or a tree planting credit into standards.
- Provide filter media guidance to prevent clogging and ensure permeability.
- Standards should identify a specific ponding depth for filtering systems and bioretention.
- Bioretention designs should incorporate internal water storage.

High Precipitation

- Add a section that discusses climate change and recommends specific adaptation measures.
- For water quantity sizing, incorporate projected storm data or other options that account for increased storm depths due to climate change.
- Incorporate storms by reference rather than including maps or static images in standards.
- Revise stormwater quantity sizing to either over-control the storm event or match a historical peak discharge.
- Enhance quantity sizing standards to consider historic flooding and downstream conditions.
- If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
- Consider future floodplain extent when identifying potential locations for stormwater BMPs.
- Incorporate additional space around BMPs to provide a right of way for large, intense storms.
- Increase the ponding depth for filtering systems and bioretention to prevent bypass of high intensity storm events.
- If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.

Drought

- Add a section that discusses climate change and recommends specific adaptation measures.
- Incorporate specific guidance for sizing rainwater harvesting systems.
- Modify existing water quality sizing to consider downstream ecology and quality.
- Prohibit or restrict the use of practices that consume water (e.g., practices with a permanent pool of water).
- Set specific goals for rainwater harvesting in the sizing criteria.
- Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in rainwater harvesting systems.
- The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
- Some plants on the landscaping list should be tolerant to periods of prolonged drought.
- Some plants on the landscaping list should be fire-resistant.
- Bioretention design should incorporate internal water storage.

Sea Level Rise

- Add a section that discusses climate change and recommends specific adaptation measures.
- The climate change section should incorporate sea level rise.
- Incorporate sizing standards adapted to sea level rise in coastal regions.
- Consider salt water intrusion and sea level rise when siting stormwater BMPs.
- Consider future floodplain extent when identifying potential locations for stormwater BMPs.
- Revise stormwater BMP siting standards to incorporate sea level rise.
- Elevate outfall inverts to the level of the projected high tide.
- Incorporate check valves to prevent backup at outlet pipes.
- Incorporate features that allow for future practice modification as climate changes.
- Oversize pipes or open channels to account for lost storage from rising sea levels.

Temperature

- Add a section that discusses climate change and recommends specific adaptation measures.
- Incorporate specific vegetation targets and/or a tree planting credit into standards.
- The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
- Select light colors for BMP materials such as permeable pavement to provide solar reflection.
- Consider the carbon footprint of BMP materials.
- Modify existing water quality sizing to consider downstream ecology and quality.

Complete List of Recommendations by Category for Michigan

Modern Manual

• Apply standards statewide.
• Reduce the disturbance threshold to less than 1 acre.
• Require Green Infrastructure practices either explicitly or as a means of achieving a goal such as runoff reduction.
• Incorporate specific vegetation targets and/or a tree planting credit into standards.
• Ensure that practices are resistant to erosion. Methods include prescribing non-erosive storm events, providing detention at the inlet, or designing practices off-line.
• Provide filter media guidance to prevent clogging and ensure permeability.
• Standards should identify a specific ponding depth for filtering systems and bioretention.
• Bioretention designs should incorporate internal water storage.

High Precipitation

• Add a section that discusses climate change and recommends specific adaptation measures.
• For water quantity sizing, incorporate projected storm data or other options that account for increased storm depths due to climate change.
• Revise stormwater quantity sizing to either over-control the storm event or match a historical peak discharge.
• Enhance quantity sizing standards to consider historic flooding and downstream conditions.
• If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
• Consider increasing the water quality storm depth to capture greater annual runoff volume.
• Provide a factor of safety when conveying the water quality storm, either by modeling a high-intensity storm or providing supplemental freeboard.
• Consider future floodplain extent when identifying potential locations for stormwater BMPs.
• Incorporate additional space around BMPs to provide a right of way for large, intense storms.
• Increase the ponding depth for filtering systems and bioretention to prevent bypass of high intensity storm events.

Drought

• Add a section that discusses climate change and recommends specific adaptation measures.
• Incorporate specific guidance for sizing rainwater harvesting systems.
• Modify existing water quality sizing to consider downstream ecology and quality.
• Prohibit or restrict the use of practices that consume water (e.g., practices with a permanent pool of water).
• Set specific goals for rainwater harvesting in the sizing criteria.
• Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in rainwater harvesting systems.
• The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
• Some plants on the landscaping list should be fire-resistant.
• Bioretention design should incorporate internal water storage.
• Consider adding polymers designed to retain soil moisture to bioretention specifications.

Sea Level Rise

No Recommendations

Temperature

• Add a section that discusses climate change and recommends specific adaptation measures.
• Incorporate specific vegetation targets and/or a tree planting credit into standards.
• Some plants on the landscaping list should provide shading or cooling.
• The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
• Select light colors for BMP materials such as permeable pavement to provide solar reflection.
• Incorporate temperature-resistance standards into BMP materials such as permeable pavement mixes.
• Consider the carbon footprint of BMP materials.
• Modify existing water quality sizing to consider downstream ecology and quality.

Complete List of Recommendations by Category for Minnesota

Modern Manual

• Reduce the disturbance threshold to less than 1 acre.

High Precipitation

• For water quantity sizing, incorporate projected storm data or other options that account for increased storm depths due to climate change.
• Revise stormwater quantity sizing to either over-control the storm event or match a historical peak discharge.
• Enhance quantity sizing standards to consider historic flooding and downstream conditions.
• If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
• Consider increasing the water quality storm depth to capture greater annual runoff volume.
• Provide a factor of safety when conveying the water quality storm, either by modeling a high-intensity storm or providing supplemental freeboard.
• Incorporate additional space around BMPs to provide a right of way for large, intense storms.
• If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.
• Incorporate Smart BMP Technology into standards and provide recommendations for its use in adapting to changing storm patterns.
• Some plants on the landscaping list should tolerate to "wet feet" and frequent inundation.

Drought

• Prohibit or restrict the use of practices that consume water (e.g., practices with a permanent pool of water).
• Set specific goals for rainwater harvesting in the sizing criteria.
• Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in rainwater harvesting systems.
• The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
• Some plants on the landscaping list should be fire-resistant.
• Consider adding polymers designed to retain soil moisture to bioretention specifications.
• Consider incorporating biochar into filter media standards.
• Consider the carbon footprint of BMP materials.

Sea Level Rise

No Recommendations

Temperature

• Some plants on the landscaping list should provide shading or cooling.
• The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
• Select light colors for BMP materials such as permeable pavement to provide solar reflection.
• Incorporate temperature-resistance standards into BMP materials such as permeable pavement mixes.
• Consider the carbon footprint of BMP materials.

Complete List of Recommendations by Category for Mississippi

Modern Manual

- Apply standards statewide.
- Reduce the disturbance threshold to less than 1 acre.
- Incorporate channel protection sizing into existing standards
- Adopt specific numeric runoff reduction and water quality sizing standards.
- Update design storms to reference the most recent available storm data.
- Incorporate specific vegetation targets and/or a tree planting credit into standards.
- Develop a maintenance checklist to guide maintenance activities.
- Incorporate a landscaping list into design standards.

High Precipitation

- Add a section that discusses climate change and recommends specific adaptation measures.
- For water quantity sizing, incorporate projected storm data or other options that account for increased storm depths due to climate change.
- Incorporate storms by reference rather than including maps or static images in standards.
- If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
- Consider increasing the water quality storm depth to capture greater annual runoff volume.
- Provide a factor of safety when conveying the water quality storm, either by modeling a high-intensity storm or providing supplemental freeboard.
- Consider future floodplain extent when identifying potential locations for stormwater BMPs.
- Incorporate additional space around BMPs to provide a right of way for large, intense storms.
- Increase the ponding depth for filtering systems and bioretention to prevent bypass of high intensity storm events.
- If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.

Drought

- Add a section that discusses climate change and recommends specific adaptation measures.
- Incorporate specific guidance for sizing rainwater harvesting systems.
- Modify existing water quality sizing to consider downstream ecology and quality.
- Prohibit or restrict the use of practices that consume water (e.g., practices with a permanent pool of water).
- Set specific goals for rainwater harvesting in the sizing criteria.
- Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in rainwater harvesting systems.
- The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
- Some plants on the landscaping list should be tolerant to periods of prolonged drought.
- Some plants on the landscaping list should be fire-resistant.
- Consider adding polymers designed to retain soil moisture to bioretention specifications.

Sea Level Rise

- Add a section that discusses climate change and recommends specific adaptation measures.
- The climate change section should incorporate sea level rise.
- Incorporate sizing standards adapted to sea level rise in coastal regions.
- Consider salt water intrusion and sea level rise when siting stormwater BMPs.
- Consider future floodplain extent when identifying potential locations for stormwater BMPs.
- Revise stormwater BMP siting standards to incorporate sea level rise.
- Elevate outfall inverts to the level of the projected high tide.
- Incorporate check valves to prevent backup at outlet pipes.
- Incorporate features that allow for future practice modification as climate changes.
- Oversize pipes or open channels to account for lost storage from rising sea levels.

Temperature

- Add a section that discusses climate change and recommends specific adaptation measures.
- Incorporate specific vegetation targets and/or a tree planting credit into standards.
- Some plants on the landscaping list should provide shading or cooling.
- The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
- Select light colors for BMP materials such as permeable pavement to provide solar reflection.
- Incorporate temperature-resistance standards into BMP materials such as permeable pavement mixes.
- Consider the carbon footprint of BMP materials.
- Modify existing water quality sizing to consider downstream ecology and quality.

Complete List of Recommendations by Category for Missouri

Modern Manual

• Develop a state stormwater manual.
• Include a list of specific stormwater BMPs that are acceptable to meet standards.
• Apply standards statewide.
• Reduce the disturbance threshold to less than 1 acre.
• Incorporate channel protection sizing into existing standards
• Update design storms to reference the most recent available storm data.
• Guidance should include Green Infrastructure practices.
• Require Green Infrastructure practices either explicitly or as a means of achieving a goal such as runoff reduction.
• Require designers to consider site design features that minimize impervious cover and protect critical natural areas (Low Impact Development)
• Incorporate specific vegetation targets and/or a tree planting credit into standards.

High Precipitation

• Add a section that discusses climate change and recommends specific adaptation measures.
• For water quantity sizing, incorporate projected storm data or other options that account for increased storm depths due to climate change.
• Incorporate storms by reference rather than including maps or static images in standards.
• If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
• Provide a factor of safety when conveying the water quality storm, either by modeling a high-intensity storm or providing supplemental freeboard.
• Consider future floodplain extent when identifying potential locations for stormwater BMPs.
• Incorporate additional space around BMPs to provide a right of way for large, intense storms.
• Increase the ponding depth for filtering systems and bioretention to prevent bypass of high intensity storm events.
• If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.
• Incorporate Smart BMP Technology into standards and provide recommendations for its use in adapting to changing storm patterns.

Drought

• Add a section that discusses climate change and recommends specific adaptation measures.
• Incorporate specific guidance for sizing rainwater harvesting systems.
• Modify existing water quality sizing to consider downstream ecology and quality.
• Prohibit or restrict the use of practices that consume water (e.g., practices with a permanent pool of water).
• Set specific goals for rainwater harvesting in the sizing criteria.
• Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in rainwater harvesting systems.
• The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
• Some plants on the landscaping list should be tolerant to periods of prolonged drought.
• Some plants on the landscaping list should be fire-resistant.
• Bioretention design should incorporate internal water storage.

Sea Level Rise

No Recommendations

Temperature

• Add a section that discusses climate change and recommends specific adaptation measures.
• Incorporate specific vegetation targets and/or a tree planting credit into standards.
• Some plants on the landscaping list should provide shading or cooling.
• The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
• Select light colors for BMP materials such as permeable pavement to provide solar reflection.
• Incorporate temperature-resistance standards into BMP materials such as permeable pavement mixes.
• Consider the carbon footprint of BMP materials.
• Modify existing water quality sizing to consider downstream ecology and quality.

Complete List of Recommendations by Category for Montana

Modern Manual

- Apply standards statewide.
- Reduce the disturbance threshold to less than 1 acre.
- Incorporate channel protection sizing into existing standards
- Adopt specific numeric runoff reduction and water quality sizing standards.
- Update design storms to reference the most recent available storm data.
- Incorporate specific vegetation targets and/or a tree planting credit into standards.
- Incorporate a landscaping list into design standards.
- Bioretention designs should incorporate internal water storage.

High Precipitation

- Add a section that discusses climate change and recommends specific adaptation measures.
- For water quantity sizing, incorporate projected storm data or other options that account for increased storm depths due to climate change.
- Incorporate storms by reference rather than including maps or static images in standards.
- If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
- Provide a factor of safety when conveying the water quality storm, either by modeling a high-intensity storm or providing supplemental freeboard.
- Consider future floodplain extent when identifying potential locations for stormwater BMPs.
- Incorporate additional space around BMPs to provide a right of way for large, intense storms.
- Increase the ponding depth for filtering systems and bioretention to prevent bypass of high intensity storm events.
- If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.
- Incorporate Smart BMP Technology into standards and provide recommendations for its use in adapting to changing storm patterns.

Drought

- Add a section that discusses climate change and recommends specific adaptation measures.
- Incorporate specific guidance for sizing rainwater harvesting systems.
- Modify existing water quality sizing to consider downstream ecology and quality.
- Prohibit or restrict the use of practices that consume water (e.g., practices with a permanent pool of water).
- Set specific goals for rainwater harvesting in the sizing criteria.
- Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in rainwater harvesting systems.
- The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
- Some plants on the landscaping list should be tolerant to periods of prolonged drought.
- Some plants on the landscaping list should be fire-resistant.
- Bioretention design should incorporate internal water storage.

Sea Level Rise

No Recommendations

Temperature

- Add a section that discusses climate change and recommends specific adaptation measures.
- Incorporate specific vegetation targets and/or a tree planting credit into standards.
- Some plants on the landscaping list should provide shading or cooling.
- The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
- Select light colors for BMP materials such as permeable pavement to provide solar reflection.
- Incorporate temperature-resistance standards into BMP materials such as permeable pavement mixes.
- Consider the carbon footprint of BMP materials.
- Modify existing water quality sizing to consider downstream ecology and quality.

Complete List of Recommendations by Category for Nebraska

Modern Manual

- Develop a state stormwater manual.
- Revise standards to incorporate specific guidance for designing and selecting stormwater BMPs.
- Include a list of specific stormwater BMPs that are acceptable to meet standards.
- Apply standards statewide.
- Reduce the disturbance threshold to less than 1 acre.
- Incorporate channel protection sizing into existing standards
- Adopt specific numeric runoff reduction and water quality sizing standards.
- Update design storms to reference the most recent available storm data.
- Guidance should include Green Infrastructure practices.
- Require Green Infrastructure practices either explicitly or as a means of achieving a goal such as runoff reduction.

High Precipitation

- Add a section that discusses climate change and recommends specific adaptation measures.
- For water quantity sizing, incorporate projected storm data or other options that account for increased storm depths due to climate change.
- Incorporate storms by reference rather than including maps or static images in standards.
- If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
- Provide a factor of safety when conveying the water quality storm, either by modeling a high-intensity storm or providing supplemental freeboard.
- Consider future floodplain extent when identifying potential locations for stormwater BMPs.
- Incorporate additional space around BMPs to provide a right of way for large, intense storms.
- Increase the ponding depth for filtering systems and bioretention to prevent bypass of high intensity storm events.
- If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.
- Incorporate Smart BMP Technology into standards and provide recommendations for its use in adapting to changing storm patterns.

Drought

- Add a section that discusses climate change and recommends specific adaptation measures.
- Incorporate specific guidance for sizing rainwater harvesting systems.
- Modify existing water quality sizing to consider downstream ecology and quality.
- Prohibit or restrict the use of practices that consume water (e.g., practices with a permanent pool of water).
- Set specific goals for rainwater harvesting in the sizing criteria.
- Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in rainwater harvesting systems.
- The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
- Some plants on the landscaping list should be tolerant to periods of prolonged drought.
- Some plants on the landscaping list should be fire-resistant.
- Bioretention design should incorporate internal water storage.

Sea Level Rise

No Recommendations

Temperature

- Add a section that discusses climate change and recommends specific adaptation measures.
- Incorporate specific vegetation targets and/or a tree planting credit into standards.
- Some plants on the landscaping list should provide shading or cooling.
- The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
- Select light colors for BMP materials such as permeable pavement to provide solar reflection.
- Incorporate temperature-resistance standards into BMP materials such as permeable pavement mixes.
- Consider the carbon footprint of BMP materials.
- Modify existing water quality sizing to consider downstream ecology and quality.

Complete List of Recommendations by Category for Nevada

Modern Manual

- Develop a state stormwater manual.
- Revise standards to incorporate specific guidance for designing and selecting stormwater BMPs.
- Include a list of specific stormwater BMPs that are acceptable to meet standards.
- Apply standards statewide.
- Reduce the disturbance threshold to less than 1 acre.
- Incorporate channel protection sizing into existing standards
- Adopt specific numeric runoff reduction and water quality sizing standards.
- Update design storms to reference the most recent available storm data.
- Guidance should include Green Infrastructure practices.
- Require Green Infrastructure practices either explicitly or as a means of achieving a goal such as runoff reduction.

High Precipitation

- Add a section that discusses climate change and recommends specific adaptation measures.
- For water quantity sizing, incorporate projected storm data or other options that account for increased storm depths due to climate change.
- Incorporate storms by reference rather than including maps or static images in standards.
- Enhance quantity sizing standards to consider historic flooding and downstream conditions.
- If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
- Provide a factor of safety when conveying the water quality storm, either by modeling a high-intensity storm or providing supplemental freeboard.
- Consider future floodplain extent when identifying potential locations for stormwater BMPs.
- Incorporate additional space around BMPs to provide a right of way for large, intense storms.
- Increase the ponding depth for filtering systems and bioretention to prevent bypass of high intensity storm events.
- If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.

Drought

- Add a section that discusses climate change and recommends specific adaptation measures.
- Incorporate specific guidance for sizing rainwater harvesting systems.
- Modify existing water quality sizing to consider downstream ecology and quality.
- Prohibit or restrict the use of practices that consume water (e.g., practices with a permanent pool of water).
- Set specific goals for rainwater harvesting in the sizing criteria.
- Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in rainwater harvesting systems.
- The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
- Some plants on the landscaping list should be tolerant to periods of prolonged drought.
- Some plants on the landscaping list should be fire-resistant.
- Bioretention design should incorporate internal water storage.

Sea Level Rise

No Recommendations

Temperature

- Add a section that discusses climate change and recommends specific adaptation measures.
- Incorporate specific vegetation targets and/or a tree planting credit into standards.
- Some plants on the landscaping list should provide shading or cooling.
- The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
- Select light colors for BMP materials such as permeable pavement to provide solar reflection.
- Incorporate temperature-resistance standards into BMP materials such as permeable pavement mixes.
- Consider the carbon footprint of BMP materials.
- Modify existing water quality sizing to consider downstream ecology and quality.

Complete List of Recommendations by Category for New_Hampshire

Modern Manual

- Review and update existing design standards.
- Apply standards statewide.
- Reduce the disturbance threshold to less than 1 acre.
- Update design storms to reference the most recent available storm data.
- Incorporate specific vegetation targets and/or a tree planting credit into standards.
- Incorporate a landscaping list into design standards.
- Bioretention designs should incorporate internal water storage.

High Precipitation

- Add a section that discusses climate change and recommends specific adaptation measures.
- For water quantity sizing, incorporate projected storm data or other options that account for increased storm depths due to climate change.
- Incorporate storms by reference rather than including maps or static images in standards.
- Revise stormwater quantity sizing to either over-control the storm event or match a historical peak discharge.
- Enhance quantity sizing standards to consider historic flooding and downstream conditions.
- If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
- Provide a factor of safety when conveying the water quality storm, either by modeling a high-intensity storm or providing supplemental freeboard.
- Consider future floodplain extent when identifying potential locations for stormwater BMPs.
- Incorporate additional space around BMPs to provide a right of way for large, intense storms.
- Increase the ponding depth for filtering systems and bioretention to prevent bypass of high intensity storm events.

Drought

- Add a section that discusses climate change and recommends specific adaptation measures.
- Incorporate specific guidance for sizing rainwater harvesting systems.
- Modify existing water quality sizing to consider downstream ecology and quality.
- Prohibit or restrict the use of practices that consume water (e.g., practices with a permanent pool of water).
- Set specific goals for rainwater harvesting in the sizing criteria.
- Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in rainwater harvesting systems.
- The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
- Some plants on the landscaping list should be tolerant to periods of prolonged drought.
- Some plants on the landscaping list should be fire-resistant.
- Bioretention design should incorporate internal water storage.

Sea Level Rise

- Add a section that discusses climate change and recommends specific adaptation measures.
- The climate change section should incorporate sea level rise.
- Consider salt water intrusion and sea level rise when siting stormwater BMPs.
- Consider future floodplain extent when identifying potential locations for stormwater BMPs.
- Revise stormwater BMP siting standards to incorporate sea level rise.
- Elevate outfall inverts to the level of the projected high tide.
- Incorporate check valves to prevent backup at outlet pipes.
- Incorporate features that allow for future practice modification as climate changes.
- Oversize pipes or open channels to account for lost storage from rising sea levels.
- Incorporate pumps or other features provide increased head during high tide into the conveyance system.

Temperature

- Add a section that discusses climate change and recommends specific adaptation measures.
- Incorporate specific vegetation targets and/or a tree planting credit into standards.
- Some plants on the landscaping list should provide shading or cooling.
- The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
- Select light colors for BMP materials such as permeable pavement to provide solar reflection.
- Incorporate temperature-resistance standards into BMP materials such as permeable pavement mixes.
- Consider the carbon footprint of BMP materials.
- Modify existing water quality sizing to consider downstream ecology and quality.

Complete List of Recommendations by Category for New_Jersey

Modern Manual

• Incorporate specific vegetation targets and/or a tree planting credit into standards.

High Precipitation

• Enhance quantity sizing standards to consider historic flooding and downstream conditions.
• If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
• Consider increasing the water quality storm depth to capture greater annual runoff volume.
• Consider future floodplain extent when identifying potential locations for stormwater BMPs.
• Incorporate additional space around BMPs to provide a right of way for large, intense storms.
• Increase the ponding depth for filtering systems and bioretention to prevent bypass of high intensity storm events.
• Incorporate Smart BMP Technology into standards and provide recommendations for its use in adapting to changing storm patterns.
• Consider biochar to increase filter permeability.
• Consider carbon footprint when selecting BMP materials.

Drought

• Incorporate specific guidance for sizing rainwater harvesting systems.
• Prohibit or restrict the use of practices that consume water (e.g., practices with a permanent pool of water).
• Set specific goals for rainwater harvesting in the sizing criteria.
• Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in rainwater harvesting systems.
• The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
• Some plants on the landscaping list should be tolerant to periods of prolonged drought.
• Some plants on the landscaping list should be fire-resistant.
• Consider adding polymers designed to retain soil moisture to bioretention specifications.
• Consider incorporating biochar into filter media standards.
• Consider the carbon footprint of BMP materials.

Sea Level Rise

• Consider salt water intrusion and sea level rise when siting stormwater BMPs.
• Consider future floodplain extent when identifying potential locations for stormwater BMPs.
• Revise stormwater BMP siting standards to incorporate sea level rise.
• Elevate outfall inverts to the level of the projected high tide.
• Incorporate check valves to prevent backup at outlet pipes.
• Incorporate features that allow for future practice modification as climate changes.
• Oversize pipes or open channels to account for lost storage from rising sea levels.
• Incorporate pumps or other features provide increased head during high tide into the conveyance system.
• Consider corrosion-resistance when selecting BMP materials.
• Revise standards to incorporate a reserve area or future practice expansion to accommodate sea level rise.

Temperature

• Incorporate specific vegetation targets and/or a tree planting credit into standards.
• Some plants on the landscaping list should provide shading or cooling.
• The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
• Select light colors for BMP materials such as permeable pavement to provide solar reflection.
• Incorporate temperature-resistance standards into BMP materials such as permeable pavement mixes.
• Consider the carbon footprint of BMP materials.

Complete List of Recommendations by Category for New_Mexico

Modern Manual

• Develop a state stormwater manual.
• Revise standards to incorporate specific guidance for designing and selecting stormwater BMPs.
• Include a list of specific stormwater BMPs that are acceptable to meet standards.
• Apply standards statewide.
• Reduce the disturbance threshold to less than 1 acre.
• Incorporate channel protection sizing into existing standards
• Adopt specific numeric runoff reduction and water quality sizing standards.
• Update design storms to reference the most recent available storm data.
• Guidance should include Green Infrastructure practices.
• Require Green Infrastructure practices either explicitly or as a means of achieving a goal such as runoff reduction.

High Precipitation

• Enhance the existing climate change section to recommend specific adaptation measures.
• For water quantity sizing, incorporate projected storm data or other options that account for increased storm depths due to climate change.
• Incorporate storms by reference rather than including maps or static images in standards.
• Enhance quantity sizing standards to consider historic flooding and downstream conditions.
• If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
• Provide a factor of safety when conveying the water quality storm, either by modeling a high-intensity storm or providing supplemental freeboard.
• Consider future floodplain extent when identifying potential locations for stormwater BMPs.
• Incorporate additional space around BMPs to provide a right of way for large, intense storms.
• Increase the ponding depth for filtering systems and bioretention to prevent bypass of high intensity storm events.
• If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.

Drought

• Enhance the existing climate change section to recommend specific adaptation measures.
• Incorporate specific guidance for sizing rainwater harvesting systems.
• Modify existing water quality sizing to consider downstream ecology and quality.
• Prohibit or restrict the use of practices that consume water (e.g., practices with a permanent pool of water).
• Set specific goals for rainwater harvesting in the sizing criteria.
• Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in rainwater harvesting systems.
• The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
• Some plants on the landscaping list should be tolerant to periods of prolonged drought.
• Some plants on the landscaping list should be fire-resistant.
• Bioretention design should incorporate internal water storage.

Sea Level Rise

No Recommendations

Temperature

• Enhance the existing climate change section to recommend specific adaptation measures.
• Incorporate specific vegetation targets and/or a tree planting credit into standards.
• Some plants on the landscaping list should provide shading or cooling.
• The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
• Select light colors for BMP materials such as permeable pavement to provide solar reflection.
• Incorporate temperature-resistance standards into BMP materials such as permeable pavement mixes.
• Consider the carbon footprint of BMP materials.
• Modify existing water quality sizing to consider downstream ecology and quality.

Complete List of Recommendations by Category for New_York

Modern Manual

• Reduce the disturbance threshold to less than 1 acre.
• Ensure that practices are resistant to erosion. Methods include prescribing non-erosive storm events, providing detention at the inlet, or designing practices off-line.

High Precipitation

• Enhance the existing climate change section to recommend specific adaptation measures.
• For water quantity sizing, incorporate projected storm data or other options that account for increased storm depths due to climate change.
• Revise stormwater quantity sizing to either over-control the storm event or match a historical peak discharge.
• Enhance quantity sizing standards to consider historic flooding and downstream conditions.
• If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
• Consider increasing the water quality storm depth to capture greater annual runoff volume.
• Increase the ponding depth for filtering systems and bioretention to prevent bypass of high intensity storm events.
• If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.
• Incorporate Smart BMP Technology into standards and provide recommendations for its use in adapting to changing storm patterns.
• Some plants on the landscaping list should tolerate to "wet feet" and frequent inundation.

Drought

• Enhance the existing climate change section to recommend specific adaptation measures.
• Prohibit or restrict the use of practices that consume water (e.g., practices with a permanent pool of water).
• Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in rainwater harvesting systems.
• Some plants on the landscaping list should be tolerant to periods of prolonged drought.
• Consider adding polymers designed to retain soil moisture to bioretention specifications.
• Consider incorporating biochar into filter media standards.
• Consider the carbon footprint of BMP materials.

Sea Level Rise

• Enhance the existing climate change section to recommend specific adaptation measures.
• Incorporate sizing standards adapted to sea level rise in coastal regions.
• Consider salt water intrusion and sea level rise when siting stormwater BMPs.
• Revise stormwater BMP siting standards to incorporate sea level rise.
• Elevate outfall inverts to the level of the projected high tide.
• Incorporate check valves to prevent backup at outlet pipes.
• Incorporate features that allow for future practice modification as climate changes.
• Oversize pipes or open channels to account for lost storage from rising sea levels.
• Incorporate pumps or other features provide increased head during high tide into the conveyance system.
• Consider corrosion-resistance when selecting BMP materials.

Temperature

• Enhance the existing climate change section to recommend specific adaptation measures.
• Some plants on the landscaping list should provide shading or cooling.
• Select light colors for BMP materials such as permeable pavement to provide solar reflection.
• Incorporate temperature-resistance standards into BMP materials such as permeable pavement mixes.
• Consider the carbon footprint of BMP materials.

Complete List of Recommendations by Category for North_Carolina

Modern Manual

• Apply standards statewide.
• Reduce the disturbance threshold to less than 1 acre.
• Incorporate channel protection sizing into existing standards
• Adopt specific numeric runoff reduction and water quality sizing standards.
• Require Green Infrastructure practices either explicitly or as a means of achieving a goal such as runoff reduction.
• Incorporate specific vegetation targets and/or a tree planting credit into standards.
• Ensure that practices are resistant to erosion. Methods include prescribing non-erosive storm events, providing detention at the inlet, or designing practices off-line.

High Precipitation

• Add a section that discusses climate change and recommends specific adaptation measures.
• For water quantity sizing, incorporate projected storm data or other options that account for increased storm depths due to climate change.
• Enhance quantity sizing standards to consider historic flooding and downstream conditions.
• If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
• Consider increasing the water quality storm depth to capture greater annual runoff volume.
• Provide a factor of safety when conveying the water quality storm, either by modeling a high-intensity storm or providing supplemental freeboard.
• Consider future floodplain extent when identifying potential locations for stormwater BMPs.
• Incorporate additional space around BMPs to provide a right of way for large, intense storms.
• If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.
• Incorporate Smart BMP Technology into standards and provide recommendations for its use in adapting to changing storm patterns.

Drought

• Add a section that discusses climate change and recommends specific adaptation measures.
• Modify existing water quality sizing to consider downstream ecology and quality.
• Prohibit or restrict the use of practices that consume water (e.g., practices with a permanent pool of water).
• Set specific goals for rainwater harvesting in the sizing criteria.
• Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in rainwater harvesting systems.
• The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
• Some plants on the landscaping list should be tolerant to periods of prolonged drought.
• Some plants on the landscaping list should be fire-resistant.
• Consider adding polymers designed to retain soil moisture to bioretention specifications.
• Consider incorporating biochar into filter media standards.

Sea Level Rise

• Add a section that discusses climate change and recommends specific adaptation measures.
• The climate change section should incorporate sea level rise.
• Consider salt water intrusion and sea level rise when siting stormwater BMPs.
• Consider future floodplain extent when identifying potential locations for stormwater BMPs.
• Revise stormwater BMP siting standards to incorporate sea level rise.
• Elevate outfall inverts to the level of the projected high tide.
• Incorporate check valves to prevent backup at outlet pipes.
• Incorporate features that allow for future practice modification as climate changes.
• Oversize pipes or open channels to account for lost storage from rising sea levels.
• Incorporate pumps or other features provide increased head during high tide into the conveyance system.

Temperature

• Add a section that discusses climate change and recommends specific adaptation measures.
• Incorporate specific vegetation targets and/or a tree planting credit into standards.
• Some plants on the landscaping list should provide shading or cooling.
• The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
• Select light colors for BMP materials such as permeable pavement to provide solar reflection.
• Incorporate temperature-resistance standards into BMP materials such as permeable pavement mixes.
• Consider the carbon footprint of BMP materials.
• Modify existing water quality sizing to consider downstream ecology and quality.

Complete List of Recommendations by Category for North_Dakota

Modern Manual

- Develop a state stormwater manual.
- Revise standards to incorporate specific guidance for designing and selecting stormwater BMPs.
- Include a list of specific stormwater BMPs that are acceptable to meet standards.
- Apply standards statewide.
- Apply standards to redevelopment.
- Reduce the disturbance threshold to less than 1 acre.
- Incorporate channel protection sizing into existing standards
- Adopt specific numeric runoff reduction and water quality sizing standards.
- Update design storms to reference the most recent available storm data.
- Guidance should include Green Infrastructure practices.

High Precipitation

- Add a section that discusses climate change and recommends specific adaptation measures.
- For water quantity sizing, incorporate projected storm data or other options that account for increased storm depths due to climate change.
- Incorporate storms by reference rather than including maps or static images in standards.
- If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
- Provide a factor of safety when conveying the water quality storm, either by modeling a high-intensity storm or providing supplemental freeboard.
- Consider future floodplain extent when identifying potential locations for stormwater BMPs.
- Incorporate additional space around BMPs to provide a right of way for large, intense storms.
- Increase the ponding depth for filtering systems and bioretention to prevent bypass of high intensity storm events.
- If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.
- Incorporate Smart BMP Technology into standards and provide recommendations for its use in adapting to changing storm patterns.

Drought

- Add a section that discusses climate change and recommends specific adaptation measures.
- Incorporate specific guidance for sizing rainwater harvesting systems.
- Modify existing water quality sizing to consider downstream ecology and quality.
- Prohibit or restrict the use of practices that consume water (e.g., practices with a permanent pool of water).
- Set specific goals for rainwater harvesting in the sizing criteria.
- Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in rainwater harvesting systems.
- The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
- Some plants on the landscaping list should be tolerant to periods of prolonged drought.
- Some plants on the landscaping list should be fire-resistant.
- Bioretention design should incorporate internal water storage.

Sea Level Rise

No Recommendations

Temperature

- Add a section that discusses climate change and recommends specific adaptation measures.
- Incorporate specific vegetation targets and/or a tree planting credit into standards.
- Some plants on the landscaping list should provide shading or cooling.
- The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
- Select light colors for BMP materials such as permeable pavement to provide solar reflection.
- Incorporate temperature-resistance standards into BMP materials such as permeable pavement mixes.
- Consider the carbon footprint of BMP materials.
- Modify existing water quality sizing to consider downstream ecology and quality.

Complete List of Recommendations by Category for Ohio

Modern Manual

• Reduce the disturbance threshold to less than 1 acre.
• Incorporate channel protection sizing into existing standards
• Adopt specific numeric runoff reduction and water quality sizing standards.
• Require Green Infrastructure practices either explicitly or as a means of achieving a goal such as runoff reduction.
• Incorporate specific vegetation targets and/or a tree planting credit into standards.
• Incorporate maintenance into BMP Design Standards.
• Ensure that practices are resistant to erosion. Methods include prescribing non-erosive storm events, providing detention at the inlet, or designing practices off-line.
• Incorporate a landscaping list into design standards.

High Precipitation

• Add a section that discusses climate change and recommends specific adaptation measures.
• For water quantity sizing, incorporate projected storm data or other options that account for increased storm depths due to climate change.
• Enhance quantity sizing standards to consider historic flooding and downstream conditions.
• If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
• Consider increasing the water quality storm depth to capture greater annual runoff volume.
• Provide a factor of safety when conveying the water quality storm, either by modeling a high-intensity storm or providing supplemental freeboard.
• Consider future floodplain extent when identifying potential locations for stormwater BMPs.
• Incorporate additional space around BMPs to provide a right of way for large, intense storms.
• Increase the ponding depth for filtering systems and bioretention to prevent bypass of high intensity storm events.
• If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.

Drought

• Add a section that discusses climate change and recommends specific adaptation measures.
• Prohibit or restrict the use of practices that consume water (e.g., practices with a permanent pool of water).
• Set specific goals for rainwater harvesting in the sizing criteria.
• Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in rainwater harvesting systems.
• The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
• Some plants on the landscaping list should be tolerant to periods of prolonged drought.
• Some plants on the landscaping list should be fire-resistant.
• Consider adding polymers designed to retain soil moisture to bioretention specifications.
• Consider the carbon footprint of BMP materials.

Sea Level Rise

No Recommendations

Temperature

• Add a section that discusses climate change and recommends specific adaptation measures.
• Incorporate specific vegetation targets and/or a tree planting credit into standards.
• Some plants on the landscaping list should provide shading or cooling.
• The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
• Select light colors for BMP materials such as permeable pavement to provide solar reflection.
• Incorporate temperature-resistance standards into BMP materials such as permeable pavement mixes.
• Consider the carbon footprint of BMP materials.

Complete List of Recommendations by Category for Oklahoma

Modern Manual

• Develop a state stormwater manual.
• Include a list of specific stormwater BMPs that are acceptable to meet standards.
• Apply standards statewide.
• Reduce the disturbance threshold to less than 1 acre.
• Incorporate channel protection sizing into existing standards
• Adopt specific numeric runoff reduction and water quality sizing standards.
• Update design storms to reference the most recent available storm data.
• Require Green Infrastructure practices either explicitly or as a means of achieving a goal such as runoff reduction.
• Require designers to consider site design features that minimize impervious cover and protect critical natural areas (Low Impact Development)
• Incorporate specific vegetation targets and/or a tree planting credit into standards.

High Precipitation

• Add a section that discusses climate change and recommends specific adaptation measures.
• For water quantity sizing, incorporate projected storm data or other options that account for increased storm depths due to climate change.
• Incorporate storms by reference rather than including maps or static images in standards.
• If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
• Provide a factor of safety when conveying the water quality storm, either by modeling a high-intensity storm or providing supplemental freeboard.
• Consider future floodplain extent when identifying potential locations for stormwater BMPs.
• Incorporate additional space around BMPs to provide a right of way for large, intense storms.
• Increase the ponding depth for filtering systems and bioretention to prevent bypass of high intensity storm events.
• If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.
• Incorporate Smart BMP Technology into standards and provide recommendations for its use in adapting to changing storm patterns.

Drought

• Add a section that discusses climate change and recommends specific adaptation measures.
• Incorporate specific guidance for sizing rainwater harvesting systems.
• Modify existing water quality sizing to consider downstream ecology and quality.
• Prohibit or restrict the use of practices that consume water (e.g., practices with a permanent pool of water).
• Set specific goals for rainwater harvesting in the sizing criteria.
• Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in rainwater harvesting systems.
• The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
• Some plants on the landscaping list should be tolerant to periods of prolonged drought.
• Some plants on the landscaping list should be fire-resistant.
• Bioretention design should incorporate internal water storage.

Sea Level Rise

No Recommendations

Temperature

• Add a section that discusses climate change and recommends specific adaptation measures.
• Incorporate specific vegetation targets and/or a tree planting credit into standards.
• Some plants on the landscaping list should provide shading or cooling.
• The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
• Select light colors for BMP materials such as permeable pavement to provide solar reflection.
• Incorporate temperature-resistance standards into BMP materials such as permeable pavement mixes.
• Consider the carbon footprint of BMP materials.
• Modify existing water quality sizing to consider downstream ecology and quality.

Complete List of Recommendations by Category for Oregon

Modern Manual

- Revise standards to incorporate specific guidance for designing and selecting stormwater BMPs.
- Apply standards statewide.
- Incorporate channel protection sizing into existing standards
- Adopt specific numeric runoff reduction and water quality sizing standards.
- Require Green Infrastructure practices either explicitly or as a means of achieving a goal such as runoff reduction.
- Incorporate specific vegetation targets and/or a tree planting credit into standards.
- Provide filter media guidance to prevent clogging and ensure permeability.
- Standards should identify a specific ponding depth for filtering systems and bioretention.

High Precipitation

- Add a section that discusses climate change and recommends specific adaptation measures.
- Incorporate storms by reference rather than including maps or static images in standards.
- Revise stormwater quantity sizing to either over-control the storm event or match a historical peak discharge.
- Enhance quantity sizing standards to consider historic flooding and downstream conditions.
- If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
- Provide a factor of safety when conveying the water quality storm, either by modeling a high-intensity storm or providing supplemental freeboard.
- Consider future floodplain extent when identifying potential locations for stormwater BMPs.
- Incorporate additional space around BMPs to provide a right of way for large, intense storms.
- Increase the ponding depth for filtering systems and bioretention to prevent bypass of high intensity storm events.
- If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.

Drought

- Add a section that discusses climate change and recommends specific adaptation measures.
- Incorporate specific guidance for sizing rainwater harvesting systems.
- Modify existing water quality sizing to consider downstream ecology and quality.
- Prohibit or restrict the use of practices that consume water (e.g., practices with a permanent pool of water).
- Set specific goals for rainwater harvesting in the sizing criteria.
- Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in rainwater harvesting systems.
- The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
- Some plants on the landscaping list should be tolerant to periods of prolonged drought.
- Some plants on the landscaping list should be fire-resistant.
- Consider adding polymers designed to retain soil moisture to bioretention specifications.

Sea Level Rise

- Add a section that discusses climate change and recommends specific adaptation measures.
- The climate change section should incorporate sea level rise.
- Incorporate sizing standards adapted to sea level rise in coastal regions.
- Consider salt water intrusion and sea level rise when siting stormwater BMPs.
- Consider future floodplain extent when identifying potential locations for stormwater BMPs.
- Revise stormwater BMP siting standards to incorporate sea level rise.
- Elevate outfall inverts to the level of the projected high tide.
- Incorporate check valves to prevent backup at outlet pipes.
- Incorporate features that allow for future practice modification as climate changes.
- Oversize pipes or open channels to account for lost storage from rising sea levels.

Temperature

- Add a section that discusses climate change and recommends specific adaptation measures.
- Incorporate specific vegetation targets and/or a tree planting credit into standards.
- The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
- Select light colors for BMP materials such as permeable pavement to provide solar reflection.
- Incorporate temperature-resistance standards into BMP materials such as permeable pavement mixes.
- Consider the carbon footprint of BMP materials.
- Modify existing water quality sizing to consider downstream ecology and quality.

Complete List of Recommendations by Category for Pennsylvania

Modern Manual

- Reduce the disturbance threshold to less than 1 acre.

High Precipitation

- Revise stormwater quantity sizing to either over-control the storm event or match a historical peak discharge.
- Incorporate additional space around BMPs to provide a right of way for large, intense storms.
- Increase the ponding depth for filtering systems and bioretention to prevent bypass of high intensity storm events.
- If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.
- Incorporate Smart BMP Technology into standards and provide recommendations for its use in adapting to changing storm patterns.
- Some plants on the landscaping list should tolerate to "wet feet" and frequent inundation.
- Consider biochar to increase filter permeability.
- Consider carbon footprint when selecting BMP materials.

Drought

- Prohibit or restrict the use of practices that consume water (e.g., practices with a permanent pool of water).
- Set specific goals for rainwater harvesting in the sizing criteria.
- Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in rainwater harvesting systems.
- Consider adding polymers designed to retain soil moisture to bioretention specifications.
- Consider the carbon footprint of BMP materials.

Sea Level Rise

- The climate change section should incorporate sea level rise.
- Incorporate sizing standards adapted to sea level rise in coastal regions.
- Consider salt water intrusion and sea level rise when siting stormwater BMPs.
- Revise stormwater BMP siting standards to incorporate sea level rise.
- Elevate outfall inverts to the level of the projected high tide.
- Incorporate check valves to prevent backup at outlet pipes.
- Incorporate features that allow for future practice modification as climate changes.
- Oversize pipes or open channels to account for lost storage from rising sea levels.
- Incorporate pumps or other features provide increased head during high tide into the conveyance system.
- Revise standards to incorporate a reserve area or future practice expansion to accommodate sea level rise.

Temperature

- Select light colors for BMP materials such as permeable pavement to provide solar reflection.
- Consider the carbon footprint of BMP materials.

Complete List of Recommendations by Category for Rhode_Island

Modern Manual

- Apply standards statewide.
- Reduce the disturbance threshold to less than 1 acre.
- Incorporate specific vegetation targets and/or a tree planting credit into standards.
- Develop a maintenance checklist to guide maintenance activities.
- Bioretention designs should incorporate internal water storage.

High Precipitation

- Enhance the existing climate change section to recommend specific adaptation measures.
- Incorporate storms by reference rather than including maps or static images in standards.
- Revise stormwater quantity sizing to either over-control the storm event or match a historical peak discharge.
- If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
- Consider increasing the water quality storm depth to capture greater annual runoff volume.
- Provide a factor of safety when conveying the water quality storm, either by modeling a high-intensity storm or providing supplemental freeboard.
- Consider future floodplain extent when identifying potential locations for stormwater BMPs.
- Incorporate additional space around BMPs to provide a right of way for large, intense storms.
- Increase the ponding depth for filtering systems and bioretention to prevent bypass of high intensity storm events.
- If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.

Drought

- Enhance the existing climate change section to recommend specific adaptation measures.
- Incorporate specific guidance for sizing rainwater harvesting systems.
- Modify existing water quality sizing to consider downstream ecology and quality.
- Prohibit or restrict the use of practices that consume water (e.g., practices with a permanent pool of water).
- Set specific goals for rainwater harvesting in the sizing criteria.
- Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in rainwater harvesting systems.
- Bioretention design should incorporate internal water storage.
- Consider adding polymers designed to retain soil moisture to bioretention specifications.
- Consider incorporating biochar into filter media standards.
- Consider the carbon footprint of BMP materials.

Sea Level Rise

- Enhance the existing climate change section to recommend specific adaptation measures.
- The climate change section should incorporate sea level rise.
- Incorporate sizing standards adapted to sea level rise in coastal regions.
- Consider salt water intrusion and sea level rise when siting stormwater BMPs.
- Consider future floodplain extent when identifying potential locations for stormwater BMPs.
- Revise stormwater BMP siting standards to incorporate sea level rise.
- Elevate outfall inverts to the level of the projected high tide.
- Incorporate check valves to prevent backup at outlet pipes.
- Incorporate features that allow for future practice modification as climate changes.
- Oversize pipes or open channels to account for lost storage from rising sea levels.

Temperature

- Enhance the existing climate change section to recommend specific adaptation measures.
- Incorporate specific vegetation targets and/or a tree planting credit into standards.
- Some plants on the landscaping list should provide shading or cooling.
- Select light colors for BMP materials such as permeable pavement to provide solar reflection.
- Incorporate temperature-resistance standards into BMP materials such as permeable pavement mixes.
- Consider the carbon footprint of BMP materials.
- Modify existing water quality sizing to consider downstream ecology and quality.

Complete List of Recommendations by Category for South_Carolina

Modern Manual

- Review and update existing design standards.
- Apply standards statewide.
- Reduce the disturbance threshold to less than 1 acre.
- Incorporate channel protection sizing into existing standards
- Incorporate specific vegetation targets and/or a tree planting credit into standards.
- Develop a maintenance checklist to guide maintenance activities.
- Incorporate a landscaping list into design standards.
- Standards should identify a specific ponding depth for filtering systems and bioretention.
- Bioretention designs should incorporate internal water storage.

High Precipitation

- Add a section that discusses climate change and recommends specific adaptation measures.
- For water quantity sizing, incorporate projected storm data or other options that account for increased storm depths due to climate change.
- Incorporate storms by reference rather than including maps or static images in standards.
- Revise stormwater quantity sizing to either over-control the storm event or match a historical peak discharge.
- If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
- Consider future floodplain extent when identifying potential locations for stormwater BMPs.
- Incorporate additional space around BMPs to provide a right of way for large, intense storms.
- Increase the ponding depth for filtering systems and bioretention to prevent bypass of high intensity storm events.
- If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.
- Incorporate Smart BMP Technology into standards and provide recommendations for its use in adapting to changing storm patterns.

Drought

- Add a section that discusses climate change and recommends specific adaptation measures.
- Incorporate specific guidance for sizing rainwater harvesting systems.
- Prohibit or restrict the use of practices that consume water (e.g., practices with a permanent pool of water).
- Set specific goals for rainwater harvesting in the sizing criteria.
- Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in rainwater harvesting systems.
- The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
- Some plants on the landscaping list should be tolerant to periods of prolonged drought.
- Some plants on the landscaping list should be fire-resistant.
- Bioretention design should incorporate internal water storage.
- Consider adding polymers designed to retain soil moisture to bioretention specifications.

Sea Level Rise

- Add a section that discusses climate change and recommends specific adaptation measures.
- The climate change section should incorporate sea level rise.
- Incorporate sizing standards adapted to sea level rise in coastal regions.
- Consider salt water intrusion and sea level rise when siting stormwater BMPs.
- Consider future floodplain extent when identifying potential locations for stormwater BMPs.
- Revise stormwater BMP siting standards to incorporate sea level rise.
- Elevate outfall inverts to the level of the projected high tide.
- Incorporate check valves to prevent backup at outlet pipes.
- Incorporate features that allow for future practice modification as climate changes.
- Oversize pipes or open channels to account for lost storage from rising sea levels.

Temperature

- Add a section that discusses climate change and recommends specific adaptation measures.
- Incorporate specific vegetation targets and/or a tree planting credit into standards.
- Some plants on the landscaping list should provide shading or cooling.
- The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
- Select light colors for BMP materials such as permeable pavement to provide solar reflection.
- Incorporate temperature-resistance standards into BMP materials such as permeable pavement mixes.
- Consider the carbon footprint of BMP materials.

Complete List of Recommendations by Category for South_Dakota

Modern Manual

- Develop a state stormwater manual.
- Revise standards to incorporate specific guidance for designing and selecting stormwater BMPs.
- Include a list of specific stormwater BMPs that are acceptable to meet standards.
- Apply standards statewide.
- Reduce the disturbance threshold to less than 1 acre.
- Incorporate channel protection sizing into existing standards
- Adopt specific numeric runoff reduction and water quality sizing standards.
- Update design storms to reference the most recent available storm data.
- Guidance should include Green Infrastructure practices.
- Require Green Infrastructure practices either explicitly or as a means of achieving a goal such as runoff reduction.

High Precipitation

- Add a section that discusses climate change and recommends specific adaptation measures.
- For water quantity sizing, incorporate projected storm data or other options that account for increased storm depths due to climate change.
- Incorporate storms by reference rather than including maps or static images in standards.
- Enhance quantity sizing standards to consider historic flooding and downstream conditions.
- If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
- Provide a factor of safety when conveying the water quality storm, either by modeling a high-intensity storm or providing supplemental freeboard.
- Consider future floodplain extent when identifying potential locations for stormwater BMPs.
- Incorporate additional space around BMPs to provide a right of way for large, intense storms.
- Increase the ponding depth for filtering systems and bioretention to prevent bypass of high intensity storm events.
- If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.

Drought

- Add a section that discusses climate change and recommends specific adaptation measures.
- Incorporate specific guidance for sizing rainwater harvesting systems.
- Modify existing water quality sizing to consider downstream ecology and quality.
- Prohibit or restrict the use of practices that consume water (e.g., practices with a permanent pool of water).
- Set specific goals for rainwater harvesting in the sizing criteria.
- Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in rainwater harvesting systems.
- The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
- Some plants on the landscaping list should be tolerant to periods of prolonged drought.
- Some plants on the landscaping list should be fire-resistant.
- Bioretention design should incorporate internal water storage.

Sea Level Rise

No Recommendations

Temperature

- Add a section that discusses climate change and recommends specific adaptation measures.
- Incorporate specific vegetation targets and/or a tree planting credit into standards.
- Some plants on the landscaping list should provide shading or cooling.
- The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
- Select light colors for BMP materials such as permeable pavement to provide solar reflection.
- Incorporate temperature-resistance standards into BMP materials such as permeable pavement mixes.
- Consider the carbon footprint of BMP materials.
- Modify existing water quality sizing to consider downstream ecology and quality.

Complete List of Recommendations by Category for Tennessee

Modern Manual

- Apply standards statewide.
- Reduce the disturbance threshold to less than 1 acre.
- Incorporate channel protection sizing into existing standards
- Standards should identify a specific ponding depth for filtering systems and bioretention.

High Precipitation

- Add a section that discusses climate change and recommends specific adaptation measures.
- For water quantity sizing, incorporate projected storm data or other options that account for increased storm depths due to climate change.
- Incorporate storms by reference rather than including maps or static images in standards.
- Revise stormwater quantity sizing to either over-control the storm event or match a historical peak discharge.
- If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
- Provide a factor of safety when conveying the water quality storm, either by modeling a high-intensity storm or providing supplemental freeboard.
- Consider future floodplain extent when identifying potential locations for stormwater BMPs.
- Incorporate additional space around BMPs to provide a right of way for large, intense storms.
- Increase the ponding depth for filtering systems and bioretention to prevent bypass of high intensity storm events.
- If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.

Drought

- Add a section that discusses climate change and recommends specific adaptation measures.
- Modify existing water quality sizing to consider downstream ecology and quality.
- Prohibit or restrict the use of practices that consume water (e.g., practices with a permanent pool of water).
- Set specific goals for rainwater harvesting in the sizing criteria.
- Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in rainwater harvesting systems.
- Some plants on the landscaping list should be fire-resistant.
- Consider adding polymers designed to retain soil moisture to bioretention specifications.
- Consider incorporating biochar into filter media standards.
- Consider the carbon footprint of BMP materials.

Sea Level Rise

No Recommendations

Temperature

- Add a section that discusses climate change and recommends specific adaptation measures.
- Some plants on the landscaping list should provide shading or cooling.
- Select light colors for BMP materials such as permeable pavement to provide solar reflection.
- Incorporate temperature-resistance standards into BMP materials such as permeable pavement mixes.
- Consider the carbon footprint of BMP materials.
- Modify existing water quality sizing to consider downstream ecology and quality.

Complete List of Recommendations by Category for Texas

Modern Manual

- Develop a state stormwater manual.
- Revise standards to incorporate specific guidance for designing and selecting stormwater BMPs.
- Include a list of specific stormwater BMPs that are acceptable to meet standards.
- Apply standards statewide.
- Reduce the disturbance threshold to less than 1 acre.
- Incorporate channel protection sizing into existing standards
- Adopt specific numeric runoff reduction and water quality sizing standards.
- Update design storms to reference the most recent available storm data.
- Guidance should include Green Infrastructure practices.
- Require Green Infrastructure practices either explicitly or as a means of achieving a goal such as runoff reduction.

High Precipitation

- Add a section that discusses climate change and recommends specific adaptation measures.
- For water quantity sizing, incorporate projected storm data or other options that account for increased storm depths due to climate change.
- Incorporate storms by reference rather than including maps or static images in standards.
- Enhance quantity sizing standards to consider historic flooding and downstream conditions.
- If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
- Provide a factor of safety when conveying the water quality storm, either by modeling a high-intensity storm or providing supplemental freeboard.
- Consider future floodplain extent when identifying potential locations for stormwater BMPs.
- Incorporate additional space around BMPs to provide a right of way for large, intense storms.
- Increase the ponding depth for filtering systems and bioretention to prevent bypass of high intensity storm events.
- If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.

Drought

- Add a section that discusses climate change and recommends specific adaptation measures.
- Incorporate specific guidance for sizing rainwater harvesting systems.
- Modify existing water quality sizing to consider downstream ecology and quality.
- Prohibit or restrict the use of practices that consume water (e.g., practices with a permanent pool of water).
- Set specific goals for rainwater harvesting in the sizing criteria.
- Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in rainwater harvesting systems.
- The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
- Some plants on the landscaping list should be tolerant to periods of prolonged drought.
- Some plants on the landscaping list should be fire-resistant.
- Bioretention design should incorporate internal water storage.

Sea Level Rise

- Add a section that discusses climate change and recommends specific adaptation measures.
- The climate change section should incorporate sea level rise.
- Incorporate sizing standards adapted to sea level rise in coastal regions.
- Consider salt water intrusion and sea level rise when siting stormwater BMPs.
- Consider future floodplain extent when identifying potential locations for stormwater BMPs.
- Revise stormwater BMP siting standards to incorporate sea level rise.
- Elevate outfall inverts to the level of the projected high tide.
- Incorporate check valves to prevent backup at outlet pipes.
- Incorporate features that allow for future practice modification as climate changes.
- Oversize pipes or open channels to account for lost storage from rising sea levels.

Temperature

- Add a section that discusses climate change and recommends specific adaptation measures.
- Incorporate specific vegetation targets and/or a tree planting credit into standards.
- Some plants on the landscaping list should provide shading or cooling.
- The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
- Select light colors for BMP materials such as permeable pavement to provide solar reflection.
- Incorporate temperature-resistance standards into BMP materials such as permeable pavement mixes.
- Consider the carbon footprint of BMP materials.
- Modify existing water quality sizing to consider downstream ecology and quality.

Complete List of Recommendations by Category for Utah

Modern Manual

• Apply standards statewide.
• Reduce the disturbance threshold to less than 1 acre.
• Incorporate channel protection sizing into existing standards
• Adopt specific numeric runoff reduction and water quality sizing standards.
• Update design storms to reference the most recent available storm data.
• Incorporate specific vegetation targets and/or a tree planting credit into standards.
• Ensure that practices are resistant to erosion. Methods include prescribing non-erosive storm events, providing detention at the inlet, or designing practices off-line.
• Provide filter media guidance to prevent clogging and ensure permeability.
• Bioretention designs should incorporate internal water storage.

High Precipitation

• Add a section that discusses climate change and recommends specific adaptation measures.
• For water quantity sizing, incorporate projected storm data or other options that account for increased storm depths due to climate change.
• Incorporate storms by reference rather than including maps or static images in standards.
• If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
• Provide a factor of safety when conveying the water quality storm, either by modeling a high-intensity storm or providing supplemental freeboard.
• Consider future floodplain extent when identifying potential locations for stormwater BMPs.
• Incorporate additional space around BMPs to provide a right of way for large, intense storms.
• If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.
• Incorporate Smart BMP Technology into standards and provide recommendations for its use in adapting to changing storm patterns.
• Some plants on the landscaping list should tolerate to "wet feet" and frequent inundation.

Drought

• Add a section that discusses climate change and recommends specific adaptation measures.
• Modify existing water quality sizing to consider downstream ecology and quality.
• Prohibit or restrict the use of practices that consume water (e.g., practices with a permanent pool of water).
• Set specific goals for rainwater harvesting in the sizing criteria.
• Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in rainwater harvesting systems.
• Some plants on the landscaping list should be tolerant to periods of prolonged drought.
• Some plants on the landscaping list should be fire-resistant.
• Bioretention design should incorporate internal water storage.
• Consider adding polymers designed to retain soil moisture to bioretention specifications.
• Consider incorporating biochar into filter media standards.

Sea Level Rise

No Recommendations

Temperature

• Add a section that discusses climate change and recommends specific adaptation measures.
• Incorporate specific vegetation targets and/or a tree planting credit into standards.
• Some plants on the landscaping list should provide shading or cooling.
• Select light colors for BMP materials such as permeable pavement to provide solar reflection.
• Incorporate temperature-resistance standards into BMP materials such as permeable pavement mixes.
• Consider the carbon footprint of BMP materials.
• Modify existing water quality sizing to consider downstream ecology and quality.

Complete List of Recommendations by Category for Vermont

Modern Manual

- Develop a maintenance checklist to guide maintenance activities.
- Incorporate a landscaping list into design standards.
- Bioretention designs should incorporate internal water storage.

High Precipitation

- Add a section that discusses climate change and recommends specific adaptation measures.
- For water quantity sizing, incorporate projected storm data or other options that account for increased storm depths due to climate change.
- Revise stormwater quantity sizing to either over-control the storm event or match a historical peak discharge.
- Enhance quantity sizing standards to consider historic flooding and downstream conditions.
- If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
- Consider increasing the water quality storm depth to capture greater annual runoff volume.
- Provide a factor of safety when conveying the water quality storm, either by modeling a high-intensity storm or providing supplemental freeboard.
- Consider future floodplain extent when identifying potential locations for stormwater BMPs.
- Incorporate additional space around BMPs to provide a right of way for large, intense storms.
- Increase the ponding depth for filtering systems and bioretention to prevent bypass of high intensity storm events.

Drought

- Add a section that discusses climate change and recommends specific adaptation measures.
- Prohibit or restrict the use of practices that consume water (e.g., practices with a permanent pool of water).
- Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in rainwater harvesting systems.
- The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
- Some plants on the landscaping list should be tolerant to periods of prolonged drought.
- Some plants on the landscaping list should be fire-resistant.
- Bioretention design should incorporate internal water storage.
- Consider incorporating biochar into filter media standards.
- Consider the carbon footprint of BMP materials.

Sea Level Rise

No Recommendations

Temperature

- Add a section that discusses climate change and recommends specific adaptation measures.
- Some plants on the landscaping list should provide shading or cooling.
- The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
- Select light colors for BMP materials such as permeable pavement to provide solar reflection.
- Incorporate temperature-resistance standards into BMP materials such as permeable pavement mixes.
- Consider the carbon footprint of BMP materials.

Complete List of Recommendations by Category for Virginia

Modern Manual

- Incorporate a landscaping list into design standards.
- Bioretention designs should incorporate internal water storage.

High Precipitation

- Enhance the existing climate change section to recommend specific adaptation measures.
- For water quantity sizing, incorporate projected storm data or other options that account for increased storm depths due to climate change.
- Revise stormwater quantity sizing to either over-control the storm event or match a historical peak discharge.
- If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
- Consider increasing the water quality storm depth to capture greater annual runoff volume.
- Incorporate additional space around BMPs to provide a right of way for large, intense storms.
- Increase the ponding depth for filtering systems and bioretention to prevent bypass of high intensity storm events.
- If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.
- Incorporate Smart BMP Technology into standards and provide recommendations for its use in adapting to changing storm patterns.
- Some plants on the landscaping list should tolerate to "wet feet" and frequent inundation.

Drought

- Enhance the existing climate change section to recommend specific adaptation measures.
- Prohibit or restrict the use of practices that consume water (e.g., practices with a permanent pool of water).
- Set specific goals for rainwater harvesting in the sizing criteria.
- Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in rainwater harvesting systems.
- The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
- Some plants on the landscaping list should be tolerant to periods of prolonged drought.
- Some plants on the landscaping list should be fire-resistant.
- Bioretention design should incorporate internal water storage.
- Consider adding polymers designed to retain soil moisture to bioretention specifications.
- Consider incorporating biochar into filter media standards.

Sea Level Rise

- Enhance the existing climate change section to recommend specific adaptation measures.
- Consider salt water intrusion and sea level rise when siting stormwater BMPs.
- Revise stormwater BMP siting standards to incorporate sea level rise.
- Incorporate features that allow for future practice modification as climate changes.
- Incorporate pumps or other features provide increased head during high tide into the conveyance system.
- Consider corrosion-resistance when selecting BMP materials.
- Revise standards to incorporate a reserve area or future practice expansion to accommodate sea level rise.
- The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
- Some plants on the landscaping list should tolerate to "wet feet" and frequent inundation.
- Some plants on the landscaping list should be salt-tolerant.

Temperature

- Enhance the existing climate change section to recommend specific adaptation measures.
- Some plants on the landscaping list should provide shading or cooling.
- The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
- Select light colors for BMP materials such as permeable pavement to provide solar reflection.
- Incorporate temperature-resistance standards into BMP materials such as permeable pavement mixes.
- Consider the carbon footprint of BMP materials.

Complete List of Recommendations by Category for Washington

Modern Manual

- Apply standards statewide.
- Incorporate specific vegetation targets and/or a tree planting credit into standards.
- Bioretention designs should incorporate internal water storage.

High Precipitation

- If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
- Incorporate additional space around BMPs to provide a right of way for large, intense storms.
- Increase the ponding depth for filtering systems and bioretention to prevent bypass of high intensity storm events.
- If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.
- Incorporate Smart BMP Technology into standards and provide recommendations for its use in adapting to changing storm patterns.
- Some plants on the landscaping list should tolerate to "wet feet" and frequent inundation.
- Consider biochar to increase filter permeability.
- Consider carbon footprint when selecting BMP materials.

Drought

- Prohibit or restrict the use of practices that consume water (e.g., practices with a permanent pool of water).
- Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in rainwater harvesting systems.
- The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
- Some plants on the landscaping list should be tolerant to periods of prolonged drought.
- Some plants on the landscaping list should be fire-resistant.
- Bioretention design should incorporate internal water storage.
- Consider the carbon footprint of BMP materials.

Sea Level Rise

- Consider salt water intrusion and sea level rise when siting stormwater BMPs.
- Revise stormwater BMP siting standards to incorporate sea level rise.
- Elevate outfall inverts to the level of the projected high tide.
- Incorporate features that allow for future practice modification as climate changes.
- Oversize pipes or open channels to account for lost storage from rising sea levels.
- Incorporate pumps or other features provide increased head during high tide into the conveyance system.
- Consider corrosion-resistance when selecting BMP materials.
- Revise standards to incorporate a reserve area or future practice expansion to accommodate sea level rise.
- The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
- Some plants on the landscaping list should tolerate to "wet feet" and frequent inundation.

Temperature

- Incorporate specific vegetation targets and/or a tree planting credit into standards.
- Some plants on the landscaping list should provide shading or cooling.
- The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
- Select light colors for BMP materials such as permeable pavement to provide solar reflection.
- Incorporate temperature-resistance standards into BMP materials such as permeable pavement mixes.
- Consider the carbon footprint of BMP materials.

Complete List of Recommendations by Category for West_Virginia

Modern Manual

• Apply standards statewide.
• Reduce the disturbance threshold to less than 1 acre.
• Incorporate specific vegetation targets and/or a tree planting credit into standards.

High Precipitation

• Add a section that discusses climate change and recommends specific adaptation measures.
• For water quantity sizing, incorporate projected storm data or other options that account for increased storm depths due to climate change.
• Incorporate storms by reference rather than including maps or static images in standards.
• Enhance quantity sizing standards to consider historic flooding and downstream conditions.
• If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
• Provide a factor of safety when conveying the water quality storm, either by modeling a high-intensity storm or providing supplemental freeboard.
• Consider future floodplain extent when identifying potential locations for stormwater BMPs.
• Incorporate additional space around BMPs to provide a right of way for large, intense storms.
• Increase the ponding depth for filtering systems and bioretention to prevent bypass of high intensity storm events.
• If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.

Drought

• Add a section that discusses climate change and recommends specific adaptation measures.
• Modify existing water quality sizing to consider downstream ecology and quality.
• Prohibit or restrict the use of practices that consume water (e.g., practices with a permanent pool of water).
• Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in rainwater harvesting systems.
• The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
• Some plants on the landscaping list should be fire-resistant.
• Consider adding polymers designed to retain soil moisture to bioretention specifications.
• Consider incorporating biochar into filter media standards.
• Consider the carbon footprint of BMP materials.

Sea Level Rise

No Recommendations

Temperature

• Add a section that discusses climate change and recommends specific adaptation measures.
• Incorporate specific vegetation targets and/or a tree planting credit into standards.
• Some plants on the landscaping list should provide shading or cooling.
• The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
• Select light colors for BMP materials such as permeable pavement to provide solar reflection.
• Incorporate temperature-resistance standards into BMP materials such as permeable pavement mixes.
• Consider the carbon footprint of BMP materials.
• Modify existing water quality sizing to consider downstream ecology and quality.

Complete List of Recommendations by Category for Wisconsin

Modern Manual

- Reduce the disturbance threshold to less than 1 acre.
- Incorporate channel protection sizing into existing standards
- Adopt specific numeric runoff reduction and water quality sizing standards.
- Update design storms to reference the most recent available storm data.
- Require Green Infrastructure practices either explicitly or as a means of achieving a goal such as runoff reduction.
- Incorporate specific vegetation targets and/or a tree planting credit into standards.
- Develop a maintenance checklist to guide maintenance activities.
- Incorporate a landscaping list into design standards.
- Provide filter media guidance to prevent clogging and ensure permeability.
- Bioretention designs should incorporate internal water storage.

High Precipitation

- Add a section that discusses climate change and recommends specific adaptation measures.
- For water quantity sizing, incorporate projected storm data or other options that account for increased storm depths due to climate change.
- Incorporate storms by reference rather than including maps or static images in standards.
- Revise stormwater quantity sizing to either over-control the storm event or match a historical peak discharge.
- If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
- Provide a factor of safety when conveying the water quality storm, either by modeling a high-intensity storm or providing supplemental freeboard.
- Consider future floodplain extent when identifying potential locations for stormwater BMPs.
- Incorporate additional space around BMPs to provide a right of way for large, intense storms.
- Increase the ponding depth for filtering systems and bioretention to prevent bypass of high intensity storm events.
- If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.

Drought

- Add a section that discusses climate change and recommends specific adaptation measures.
- Incorporate specific guidance for sizing rainwater harvesting systems.
- Modify existing water quality sizing to consider downstream ecology and quality.
- Prohibit or restrict the use of practices that consume water (e.g., practices with a permanent pool of water).
- Set specific goals for rainwater harvesting in the sizing criteria.
- Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in rainwater harvesting systems.
- The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
- Some plants on the landscaping list should be tolerant to periods of prolonged drought.
- Some plants on the landscaping list should be fire-resistant.
- Bioretention design should incorporate internal water storage.

Sea Level Rise

No Recommendations

Temperature

- Add a section that discusses climate change and recommends specific adaptation measures.
- Incorporate specific vegetation targets and/or a tree planting credit into standards.
- Some plants on the landscaping list should provide shading or cooling.
- The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
- Select light colors for BMP materials such as permeable pavement to provide solar reflection.
- Incorporate temperature-resistance standards into BMP materials such as permeable pavement mixes.
- Consider the carbon footprint of BMP materials.
- Modify existing water quality sizing to consider downstream ecology and quality.

Complete List of Recommendations by Category for Wyoming

Modern Manual

- Develop a state stormwater manual.
- Revise standards to incorporate specific guidance for designing and selecting stormwater BMPs.
- Include a list of specific stormwater BMPs that are acceptable to meet standards.
- Apply standards statewide.
- Apply standards to redevelopment.
- Reduce the disturbance threshold to less than 1 acre.
- Incorporate channel protection sizing into existing standards
- Adopt specific numeric runoff reduction and water quality sizing standards.
- Update design storms to reference the most recent available storm data.
- Guidance should include Green Infrastructure practices.

High Precipitation

- Add a section that discusses climate change and recommends specific adaptation measures.
- For water quantity sizing, incorporate projected storm data or other options that account for increased storm depths due to climate change.
- Incorporate storms by reference rather than including maps or static images in standards.
- Enhance quantity sizing standards to consider historic flooding and downstream conditions.
- If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
- Provide a factor of safety when conveying the water quality storm, either by modeling a high-intensity storm or providing supplemental freeboard.
- Consider future floodplain extent when identifying potential locations for stormwater BMPs.
- Incorporate additional space around BMPs to provide a right of way for large, intense storms.
- Increase the ponding depth for filtering systems and bioretention to prevent bypass of high intensity storm events.
- If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.

Drought

- Add a section that discusses climate change and recommends specific adaptation measures.
- Incorporate specific guidance for sizing rainwater harvesting systems.
- Modify existing water quality sizing to consider downstream ecology and quality.
- Prohibit or restrict the use of practices that consume water (e.g., practices with a permanent pool of water).
- Set specific goals for rainwater harvesting in the sizing criteria.
- Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in rainwater harvesting systems.
- The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
- Some plants on the landscaping list should be tolerant to periods of prolonged drought.
- Some plants on the landscaping list should be fire-resistant.
- Bioretention design should incorporate internal water storage.

Sea Level Rise

No Recommendations

Temperature

- Add a section that discusses climate change and recommends specific adaptation measures.
- Incorporate specific vegetation targets and/or a tree planting credit into standards.
- Some plants on the landscaping list should provide shading or cooling.
- The landscaping section should suggest methods to modify plant selections based on changing climate conditions.
- Select light colors for BMP materials such as permeable pavement to provide solar reflection.
- Incorporate temperature-resistance standards into BMP materials such as permeable pavement mixes.
- Consider the carbon footprint of BMP materials.
- Modify existing water quality sizing to consider downstream ecology and quality.