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

- Adopt specific numeric runoff reduction and water quality sizing standards.
- Apply standards statewide.
- Bioretention designs should incorporate internal water storage.
- 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 channel protection sizing into existing standards
- Incorporate specific vegetation targets and/or a tree planting credit into standards.
- Provide filter media guidance to prevent clogging and ensure permeability.
- 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.
- 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.
- Consider biochar to increase filter permeability.
- Consider carbon footprint when selecting BMP materials.
- 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.
- If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
- If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.
- Incorporate additional space around BMPs to provide a right of way for large, intense storms.
- Incorporate Smart BMP Technology into standards and provide recommendations for its use in adapting to changing storm patterns.
- Incorporate storms by reference rather than including maps or static images in standards.

Drought

- Add a section that discusses climate change and recommends specific adaptation measures.
- 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.
- Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in rainwater harvesting systems.
- 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.

Sea Level Rise

- Add a section that discusses climate change and recommends specific adaptation measures.
- Consider corrosion-resistance when selecting BMP materials.
- Consider salt water intrusion and sea level rise when siting stormwater BMPs.
- Consider the carbon footprint of BMP materials.
- 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.
- Incorporate pumps or other features provide increased head during high tide into the conveyance system.
- Oversize pipes or open channels to account for lost storage from rising sea levels.
- Provide guidance for converting stormwater BMPs to other practices (e.g., from an infiltration practice to a wetland) in the event of future sea level rise.

Temperature

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

Complete List of Recommendations by Category for Alaska

Modern Manual

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

High Precipitation

- Consider biochar to increase filter permeability.
- Consider carbon footprint when selecting BMP materials.
- Consider future floodplain extent when identifying potential locations for stormwater BMPs.
- Consider increasing the water quality storm depth to capture greater annual runoff volume.
- 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.
- If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
- If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.
- Incorporate additional space around BMPs to provide a right of way for large, intense storms.
- Incorporate Smart BMP Technology into standards and provide recommendations for its use in adapting to changing storm patterns.

Drought

- 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.
- Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in 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.
- Some plants on the landscaping list should be fire-resistant.
- Some plants on the landscaping list should be tolerant to periods of prolonged drought.

Sea Level Rise

- Consider corrosion-resistance when selecting BMP materials.
- Consider future floodplain extent when identifying potential locations for stormwater BMPs.
- Consider salt water intrusion and sea level rise when siting stormwater BMPs.
- Consider the carbon footprint of BMP materials.
- 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.
- Incorporate pumps or other features provide increased head during high tide into the conveyance system.
- Incorporate sizing standards adapted to sea level rise in coastal regions.
- Oversize pipes or open channels to account for lost storage from rising sea levels.

Temperature

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

Complete List of Recommendations by Category for Arizona

Modern Manual

- Adopt specific numeric runoff reduction and water quality sizing standards.
- Apply standards statewide.
- Bioretention designs should incorporate internal water storage.
- Develop a maintenance checklist to guide maintenance activities.
- Develop a state stormwater 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.
- Guidance should include Green Infrastructure practices.
- Include a list of specific stormwater BMPs that are acceptable to meet standards.
- Incorporate a landscaping list into design standards.
- Incorporate channel protection sizing into existing standards

High Precipitation

- Add a section that discusses climate change and recommends specific adaptation measures.
- Consider biochar to increase filter permeability.
- Consider carbon footprint when selecting BMP materials.
- Consider future floodplain extent when identifying potential locations for stormwater BMPs.
- 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.
- If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
- If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.
- Incorporate additional space around BMPs to provide a right of way for large, intense storms.
- 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.
- 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.
- Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in rainwater harvesting systems.
- 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.

Sea Level Rise

No Recommendations

Temperature

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

Complete List of Recommendations by Category for Arkansas

Modern Manual

- Adopt specific numeric runoff reduction and water quality sizing standards.
- Bioretention designs should incorporate internal water storage.
- Develop a state stormwater 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.
- Guidance should include Green Infrastructure practices.
- Include a list of specific stormwater BMPs that are acceptable to meet standards.
- Incorporate a landscaping list into design standards.
- Incorporate channel protection sizing into existing standards
- Incorporate preatreatment into design standards.
- 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.
- Consider biochar to increase filter permeability.
- Consider carbon footprint when selecting BMP materials.
- Consider future floodplain extent when identifying potential locations for stormwater BMPs.
- Enhance quantity sizing standards to consider historic flooding and downstream conditions.
- For water quantity sizing, incorporate projected storm data or other options that account for increased storm depths due to climate change.
- If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
- If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.
- Incorporate additional space around BMPs to provide a right of way for large, intense storms.
- 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.
- 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.
- Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in rainwater harvesting systems.
- 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.

Sea Level Rise

No Recommendations

Temperature

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

Complete List of Recommendations by Category for California

Modern Manual

- Bioretention designs should incorporate internal water storage.
- 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.
- Incorporate specific vegetation targets and/or a tree planting credit into 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.
- Consider biochar to increase filter permeability.
- Consider carbon footprint when selecting BMP materials.
- Consider future floodplain extent when identifying potential locations for stormwater BMPs.
- 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.
- If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
- If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.
- Incorporate additional space around BMPs to provide a right of way for large, intense storms.
- 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.
- 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.
- Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in 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.
- Some plants on the landscaping list should be fire-resistant.
- Some plants on the landscaping list should be tolerant to periods of prolonged drought.

Sea Level Rise

- Add a section that discusses climate change and recommends specific adaptation measures.
- Consider corrosion-resistance when selecting BMP materials.
- Consider future floodplain extent when identifying potential locations for stormwater BMPs.
- Consider salt water intrusion and sea level rise when siting stormwater BMPs.
- Consider the carbon footprint of BMP materials.
- 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.
- Incorporate pumps or other features provide increased head during high tide into the conveyance system.
- Incorporate sizing standards adapted to sea level rise in coastal regions.

Temperature

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

Complete List of Recommendations by Category for Colorado

Modern Manual

- Adopt specific numeric runoff reduction and water quality sizing standards.
- Apply standards statewide.
- Bioretention designs should incorporate internal water storage.
- Develop a maintenance checklist to guide maintenance activities.
- Develop a state stormwater 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.
- Guidance should include Green Infrastructure practices.
- Include a list of specific stormwater BMPs that are acceptable to meet standards.
- Incorporate a landscaping list into design standards.
- Incorporate channel protection sizing into existing standards

High Precipitation

- Add a section that discusses climate change and recommends specific adaptation measures.
- Consider biochar to increase filter permeability.
- Consider carbon footprint when selecting BMP materials.
- Consider future floodplain extent when identifying potential locations for stormwater BMPs.
- 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.
- If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
- If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.
- Incorporate additional space around BMPs to provide a right of way for large, intense storms.
- 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.
- 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.
- Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in rainwater harvesting systems.
- 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.

Sea Level Rise

No Recommendations

Temperature

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

Complete List of Recommendations by Category for Connecticut

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.
• Incorporate specific vegetation targets and/or a tree planting credit into standards.
• Revise standards to incorporate specific guidance for designing and selecting stormwater BMPs.
• Standards should identify a specific ponding depth for filtering systems and bioretention.

High Precipitation

• Consider biochar to increase filter permeability.
• Consider carbon footprint when selecting BMP materials.
• Consider future floodplain extent when identifying potential locations for stormwater BMPs.
• Consider increasing the water quality storm depth to capture greater annual runoff volume.
• Enhance quantity sizing standards to consider historic flooding and downstream conditions.
• For water quantity sizing, incorporate projected storm data or other options that account for increased storm depths due to climate change.
• If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
• If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.
• Incorporate additional space around BMPs to provide a right of way for large, intense storms.
• Incorporate Smart BMP Technology into standards and provide recommendations for its use in adapting to changing storm patterns.

Drought

• Consider adding polymers designed to retain soil moisture to bioretention specifications.
• Consider the carbon footprint of BMP materials.
• Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in rainwater harvesting systems.
• 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.
• Some plants on the landscaping list should be fire-resistant.
• The landscaping section should suggest methods to modify plant selections based on changing climate conditions.

Sea Level Rise

• Consider corrosion-resistance when selecting BMP materials.
• Consider future floodplain extent when identifying potential locations for stormwater BMPs.
• Consider the carbon footprint of BMP materials.
• 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.
• Incorporate pumps or other features provide increased head during high tide into the conveyance system.
• Incorporate sizing standards adapted to sea level rise in coastal regions.
• Oversize pipes or open channels to account for lost storage from rising sea levels.
• Provide guidance for converting stormwater BMPs to other practices (e.g., from an infiltration practice to a wetland) in the event of future sea level rise.

Temperature

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

Complete List of Recommendations by Category for Delaware

Modern Manual

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

High Precipitation

- Add a section that discusses climate change and recommends specific adaptation measures.
- Consider biochar to increase filter permeability.
- Consider carbon footprint when selecting BMP materials.
- Consider future floodplain extent when identifying potential locations for stormwater BMPs.
- Enhance quantity sizing standards to consider historic flooding and downstream conditions.
- For water quantity sizing, incorporate projected storm data or other options that account for increased storm depths due to climate change.
- If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
- If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.
- Incorporate additional space around BMPs to provide a right of way for large, intense storms.
- 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.
- 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.
- Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in 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.
- Some plants on the landscaping list should be fire-resistant.

Sea Level Rise

- Add a section that discusses climate change and recommends specific adaptation measures.
- Consider corrosion-resistance when selecting BMP materials.
- Consider future floodplain extent when identifying potential locations for stormwater BMPs.
- Consider salt water intrusion and sea level rise when siting stormwater BMPs.
- Consider the carbon footprint of BMP materials.
- 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.
- Incorporate pumps or other features provide increased head during high tide into the conveyance system.
- 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.
- Consider the carbon footprint of BMP materials.
- Incorporate specific vegetation targets and/or a tree planting credit into standards.
- Incorporate temperature-resistance standards into BMP materials such as permeable pavement mixes.
- Modify existing water quality sizing to consider downstream ecology and quality.
- Select light colors for BMP materials such as permeable pavement to provide solar reflection.
- 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.

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.
• Consider biochar to increase filter permeability.
• Consider carbon footprint when selecting BMP materials.
• Consider increasing the water quality storm depth to capture greater annual runoff volume.
• Enhance quantity sizing standards to consider historic flooding and downstream conditions.
• For water quantity sizing, incorporate projected storm data or other options that account for increased storm depths due to climate change.
• If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
• If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.
• Incorporate additional space around BMPs to provide a right of way for large, intense storms.
• 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.
• 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.
• Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in 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.
• Some plants on the landscaping list should be fire-resistant.
• The landscaping section should suggest methods to modify plant selections based on changing climate conditions.

Sea Level Rise

• Add a section that discusses climate change and recommends specific adaptation measures.
• Consider corrosion-resistance when selecting BMP materials.
• Consider salt water intrusion and sea level rise when siting stormwater BMPs.
• Consider the carbon footprint of BMP materials.
• Elevate outfall inverts to the level of the projected high tide.
• Incorporate features that allow for future practice modification as climate changes.
• Incorporate sizing standards adapted to sea level rise in coastal regions.
• Oversize pipes or open channels to account for lost storage from rising sea levels.
• Provide guidance for converting stormwater BMPs to other practices (e.g., from an infiltration practice to a wetland) in the event of future sea level rise.
• 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.
• Consider the carbon footprint of BMP materials.
• Incorporate temperature-resistance standards into BMP materials such as permeable pavement mixes.
• Select light colors for BMP materials such as permeable pavement to provide solar reflection.
• 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.

Complete List of Recommendations by Category for Florida

Modern Manual

- Adopt specific numeric runoff reduction and water quality sizing standards.
- Bioretention designs should incorporate internal water storage.
- Ensure that practices are resistant to erosion. Methods include prescribing non-erosive storm events, providing detention at the inlet, or designing practices off-line.
- Guidance should include Green Infrastructure practices.
- Incorporate a landscaping list into design standards.
- Incorporate preatreatment into design standards.
- Incorporate specific vegetation targets and/or a tree planting credit into standards.
- Provide filter media guidance to prevent clogging and ensure permeability.
- Require designers to consider site design features that minimize impervious cover and protect critical natural areas (Low Impact Development)
- 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.
- Consider biochar to increase filter permeability.
- Consider carbon footprint when selecting BMP materials.
- Consider future floodplain extent when identifying potential locations for stormwater BMPs.
- Enhance quantity sizing standards to consider historic flooding and downstream conditions.
- For water quantity sizing, incorporate projected storm data or other options that account for increased storm depths due to climate change.
- If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
- If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.
- Incorporate additional space around BMPs to provide a right of way for large, intense storms.
- 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.
- 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.
- Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in 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.
- Some plants on the landscaping list should be fire-resistant.

Sea Level Rise

- Add a section that discusses climate change and recommends specific adaptation measures.
- Consider corrosion-resistance when selecting BMP materials.
- Consider future floodplain extent when identifying potential locations for stormwater BMPs.
- Consider salt water intrusion and sea level rise when siting stormwater BMPs.
- Consider the carbon footprint of BMP materials.
- 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.
- Incorporate pumps or other features provide increased head during high tide into the conveyance system.
- 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.
- Consider the carbon footprint of BMP materials.
- Incorporate specific vegetation targets and/or a tree planting credit into standards.
- Incorporate temperature-resistance standards into BMP materials such as permeable pavement mixes.
- Modify existing water quality sizing to consider downstream ecology and quality.
- Select light colors for BMP materials such as permeable pavement to provide solar reflection.
- 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.

Complete List of Recommendations by Category for Georgia

Modern Manual

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

High Precipitation

- Consider biochar to increase filter permeability.
- Consider carbon footprint when selecting BMP materials.
- Consider increasing the water quality storm depth to capture greater annual runoff volume.
- Enhance quantity sizing standards to consider historic flooding and downstream conditions.
- For water quantity sizing, incorporate projected storm data or other options that account for increased storm depths due to climate change.
- If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
- If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.
- Incorporate additional space around BMPs to provide a right of way for large, intense storms.
- Incorporate Smart BMP Technology into standards and provide recommendations for its use in adapting to changing storm patterns.
- Increase the ponding depth for filtering systems and bioretention to prevent bypass of high intensity storm events.

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.
- Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in 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.
- Some plants on the landscaping list should be fire-resistant.

Sea Level Rise

- Consider corrosion-resistance when selecting BMP materials.
- Consider salt water intrusion and sea level rise when siting stormwater BMPs.
- Consider the carbon footprint of BMP materials.
- Incorporate check valves to prevent backup at outlet pipes.
- 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.
- Incorporate sizing standards adapted to sea level rise in coastal regions.
- Oversize pipes or open channels to account for lost storage from rising sea levels.
- Revise standards to incorporate a reserve area or future practice expansion to accommodate sea level rise.
- Revise stormwater BMP siting standards to incorporate sea level rise.

Temperature

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

Complete List of Recommendations by Category for Hawaii

Modern Manual

- Adopt specific numeric runoff reduction and water quality sizing standards.
- Apply standards statewide.
- Bioretention designs should incorporate internal water storage.
- Develop a maintenance checklist to guide maintenance activities.
- Develop a state stormwater manual.
- Incorporate a landscaping list into design standards.
- Incorporate channel protection sizing into existing standards
- Incorporate specific vegetation targets and/or a tree planting credit into standards.
- Provide filter media guidance to prevent clogging and ensure permeability.
- Reduce the disturbance threshold to less than 1 acre.

High Precipitation

- Add a section that discusses climate change and recommends specific adaptation measures.
- Consider biochar to increase filter permeability.
- Consider carbon footprint when selecting BMP materials.
- Consider future floodplain extent when identifying potential locations for stormwater BMPs.
- 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.
- If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
- If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.
- Incorporate additional space around BMPs to provide a right of way for large, intense storms.
- 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.
- 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.
- Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in 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.
- Some plants on the landscaping list should be fire-resistant.

Sea Level Rise

- Add a section that discusses climate change and recommends specific adaptation measures.
- Consider corrosion-resistance when selecting BMP materials.
- Consider future floodplain extent when identifying potential locations for stormwater BMPs.
- Consider salt water intrusion and sea level rise when siting stormwater BMPs.
- Consider the carbon footprint of BMP materials.
- 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.
- Incorporate pumps or other features provide increased head during high tide into the conveyance system.
- Incorporate sizing standards adapted to sea level rise in coastal regions.

Temperature

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

Complete List of Recommendations by Category for Idaho

Modern Manual

- Adopt specific numeric runoff reduction and water quality sizing standards.
- Apply standards statewide.
- Bioretention designs should incorporate internal water storage.
- Develop a state stormwater 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.
- Guidance should include Green Infrastructure practices.
- Incorporate a landscaping list into design standards.
- Incorporate preatreatment into design standards.
- Incorporate specific vegetation targets and/or a tree planting credit into 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.
- Consider biochar to increase filter permeability.
- Consider carbon footprint when selecting BMP materials.
- Consider future floodplain extent when identifying potential locations for stormwater BMPs.
- Enhance quantity sizing standards to consider historic flooding and downstream conditions.
- For water quantity sizing, incorporate projected storm data or other options that account for increased storm depths due to climate change.
- If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
- If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.
- Incorporate additional space around BMPs to provide a right of way for large, intense storms.
- 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.
- 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.
- Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in rainwater harvesting systems.
- 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.

Sea Level Rise

No Recommendations

Temperature

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

Complete List of Recommendations by Category for Illinois

Modern Manual

• Adopt specific numeric runoff reduction and water quality sizing standards.
• Apply standards statewide.
• Bioretention designs should incorporate internal water storage.
• 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 channel protection sizing into existing standards
• 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.
• Standards should identify a specific ponding depth for filtering systems and bioretention.
• Update design storms to reference the most recent available storm data.

High Precipitation

• Add a section that discusses climate change and recommends specific adaptation measures.
• Consider biochar to increase filter permeability.
• Consider carbon footprint when selecting BMP materials.
• Consider future floodplain extent when identifying potential locations for stormwater BMPs.
• Enhance quantity sizing standards to consider historic flooding and downstream conditions.
• For water quantity sizing, incorporate projected storm data or other options that account for increased storm depths due to climate change.
• If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
• If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.
• Incorporate additional space around BMPs to provide a right of way for large, intense storms.
• 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.
• Bioretention design should incorporate internal water storage.
• Consider incorporating biochar into filter media standards.
• Consider the carbon footprint of BMP materials.
• Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in rainwater harvesting systems.
• 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.
• Some plants on the landscaping list should be fire-resistant.

Sea Level Rise

No Recommendations

Temperature

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

Complete List of Recommendations by Category for Indiana

Modern Manual

- Adopt specific numeric runoff reduction and water quality sizing standards.
- Apply standards statewide.
- Bioretention designs should incorporate internal water storage.
- 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 channel protection sizing into existing standards
- Incorporate specific vegetation targets and/or a tree planting credit into standards.
- Provide filter media guidance to prevent clogging and ensure permeability.
- 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.
- 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.
- Consider biochar to increase filter permeability.
- Consider carbon footprint when selecting BMP materials.
- Consider future floodplain extent when identifying potential locations for stormwater BMPs.
- Enhance quantity sizing standards to consider historic flooding and downstream conditions.
- For water quantity sizing, incorporate projected storm data or other options that account for increased storm depths due to climate change.
- If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
- If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.
- Incorporate additional space around BMPs to provide a right of way for large, intense storms.
- 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.
- 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.
- Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in rainwater harvesting systems.
- 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.

Sea Level Rise

No Recommendations

Temperature

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

Complete List of Recommendations by Category for Iowa

Modern Manual

- Apply standards statewide.
- Develop a maintenance checklist to guide maintenance activities.
- Guidance should include Green Infrastructure practices.
- Incorporate specific vegetation targets and/or a tree planting credit into 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.
- Consider biochar to increase filter permeability.
- Consider carbon footprint when selecting BMP materials.
- Consider future floodplain extent when identifying potential locations for stormwater BMPs.
- 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.
- If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.
- Incorporate additional space around BMPs to provide a right of way for large, intense storms.
- Incorporate Smart BMP Technology into standards and provide recommendations for its use in adapting to changing storm patterns.
- 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.
- Consider incorporating biochar into filter media standards.
- Consider the carbon footprint of BMP materials.
- Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in rainwater harvesting systems.
- 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.
- Some plants on the landscaping list should be fire-resistant.
- Some plants on the landscaping list should be tolerant to periods of prolonged drought.

Sea Level Rise

No Recommendations

Temperature

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

Complete List of Recommendations by Category for Kansas

Modern Manual

- Adopt specific numeric runoff reduction and water quality sizing standards.
- Apply standards statewide.
- Bioretention designs should incorporate internal water storage.
- Develop a maintenance checklist to guide maintenance activities.
- Develop a state stormwater 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.
- Guidance should include Green Infrastructure practices.
- Include a list of specific stormwater BMPs that are acceptable to meet standards.
- Incorporate a landscaping list into design standards.
- Incorporate channel protection sizing into existing standards

High Precipitation

- Add a section that discusses climate change and recommends specific adaptation measures.
- Consider biochar to increase filter permeability.
- Consider carbon footprint when selecting BMP materials.
- Consider future floodplain extent when identifying potential locations for stormwater BMPs.
- Enhance quantity sizing standards to consider historic flooding and downstream conditions.
- For water quantity sizing, incorporate projected storm data or other options that account for increased storm depths due to climate change.
- If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
- If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.
- Incorporate additional space around BMPs to provide a right of way for large, intense storms.
- 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.
- 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.
- Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in rainwater harvesting systems.
- 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.

Sea Level Rise

No Recommendations

Temperature

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

Complete List of Recommendations by Category for Kentucky

Modern Manual

- Adopt specific numeric runoff reduction and water quality sizing standards.
- Apply standards statewide.
- Bioretention designs should incorporate internal water storage.
- Develop a maintenance checklist to guide maintenance activities.
- Develop a state stormwater 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.
- Incorporate a landscaping list into design standards.
- Incorporate channel protection sizing into existing standards
- Incorporate maintenance into BMP Design Standards.
- Incorporate preatreatment into design standards.

High Precipitation

- Add a section that discusses climate change and recommends specific adaptation measures.
- Consider biochar to increase filter permeability.
- Consider carbon footprint when selecting BMP materials.
- Consider future floodplain extent when identifying potential locations for stormwater BMPs.
- 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.
- If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
- If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.
- Incorporate additional space around BMPs to provide a right of way for large, intense storms.
- 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.
- 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.
- Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in rainwater harvesting systems.
- 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.

Sea Level Rise

No Recommendations

Temperature

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

Complete List of Recommendations by Category for Louisiana

Modern Manual

- Adopt specific numeric runoff reduction and water quality sizing standards.
- Apply standards statewide.
- Bioretention designs should incorporate internal water storage.
- Develop a maintenance checklist to guide maintenance activities.
- Develop a state stormwater 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.
- Guidance should include Green Infrastructure practices.
- Include a list of specific stormwater BMPs that are acceptable to meet standards.
- Incorporate a landscaping list into design standards.
- Incorporate channel protection sizing into existing standards

High Precipitation

- Add a section that discusses climate change and recommends specific adaptation measures.
- Consider biochar to increase filter permeability.
- Consider carbon footprint when selecting BMP materials.
- Consider future floodplain extent when identifying potential locations for stormwater BMPs.
- 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.
- If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
- If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.
- Incorporate additional space around BMPs to provide a right of way for large, intense storms.
- 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.
- 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.
- Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in rainwater harvesting systems.
- 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.

Sea Level Rise

- Add a section that discusses climate change and recommends specific adaptation measures.
- Consider corrosion-resistance when selecting BMP materials.
- Consider future floodplain extent when identifying potential locations for stormwater BMPs.
- Consider salt water intrusion and sea level rise when siting stormwater BMPs.
- Consider the carbon footprint of BMP materials.
- 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.
- Incorporate pumps or other features provide increased head during high tide into the conveyance system.
- Incorporate sizing standards adapted to sea level rise in coastal regions.

Temperature

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

Complete List of Recommendations by Category for Maine

Modern Manual

- Adopt specific numeric runoff reduction and water quality sizing standards.
- Bioretention designs should incorporate internal water storage.
- 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.
- Incorporate specific vegetation targets and/or a tree planting credit into standards.
- Provide filter media guidance to prevent clogging and ensure permeability.
- 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.
- 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.
- Consider biochar to increase filter permeability.
- Consider carbon footprint when selecting BMP materials.
- Consider future floodplain extent when identifying potential locations for stormwater BMPs.
- Consider increasing the water quality storm depth to capture greater annual runoff volume.
- 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.
- If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
- If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.
- Incorporate additional space around BMPs to provide a right of way for large, intense storms.

Drought

- Add a section that discusses climate change and recommends specific adaptation measures.
- 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.
- Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in rainwater harvesting systems.
- 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.
- Some plants on the landscaping list should be fire-resistant.

Sea Level Rise

- Add a section that discusses climate change and recommends specific adaptation measures.
- Consider corrosion-resistance when selecting BMP materials.
- Consider future floodplain extent when identifying potential locations for stormwater BMPs.
- Consider salt water intrusion and sea level rise when siting stormwater BMPs.
- Consider the carbon footprint of BMP materials.
- 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.
- Incorporate pumps or other features provide increased head during high tide into the conveyance system.
- Incorporate sizing standards adapted to sea level rise in coastal regions.

Temperature

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

Complete List of Recommendations by Category for Maryland

Modern Manual

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

High Precipitation

- Add a section that discusses climate change and recommends specific adaptation measures.
- Consider biochar to increase filter permeability.
- Consider carbon footprint when selecting BMP materials.
- Consider increasing the water quality storm depth to capture greater annual runoff volume.
- Enhance quantity sizing standards to consider historic flooding and downstream conditions.
- For water quantity sizing, incorporate projected storm data or other options that account for increased storm depths due to climate change.
- If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
- If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.
- Incorporate additional space around BMPs to provide a right of way for large, intense storms.
- 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.
- 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.
- Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in rainwater harvesting systems.
- 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.
- Some plants on the landscaping list should be fire-resistant.

Sea Level Rise

- Add a section that discusses climate change and recommends specific adaptation measures.
- Consider corrosion-resistance when selecting BMP materials.
- Consider salt water intrusion and sea level rise when siting stormwater BMPs.
- Consider the carbon footprint of BMP materials.
- Enhance the existing climate change section to recommend specific adaptation measures.
- 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.
- Provide guidance for converting stormwater BMPs to other practices (e.g., from an infiltration practice to a wetland) in the event of future sea level rise.
- Revise standards to incorporate a reserve area or future practice expansion to accommodate sea level rise.
- Revise stormwater BMP siting standards to incorporate sea level rise.

Temperature

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

Complete List of Recommendations by Category for Massachusetts

Modern Manual

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

High Precipitation

- Add a section that discusses climate change and recommends specific adaptation measures.
- Consider biochar to increase filter permeability.
- Consider carbon footprint when selecting BMP materials.
- Consider future floodplain extent when identifying potential locations for stormwater BMPs.
- Enhance quantity sizing standards to consider historic flooding and downstream conditions.
- For water quantity sizing, incorporate projected storm data or other options that account for increased storm depths due to climate change.
- If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
- If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.
- Incorporate additional space around BMPs to provide a right of way for large, intense storms.
- 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.
- 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.
- Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in rainwater harvesting systems.
- 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.

Sea Level Rise

- Add a section that discusses climate change and recommends specific adaptation measures.
- Consider corrosion-resistance when selecting BMP materials.
- Consider future floodplain extent when identifying potential locations for stormwater BMPs.
- Consider salt water intrusion and sea level rise when siting stormwater BMPs.
- Consider the carbon footprint of BMP materials.
- 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.
- Incorporate pumps or other features provide increased head during high tide into the conveyance system.
- Incorporate sizing standards adapted to sea level rise in coastal regions.

Temperature

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

Complete List of Recommendations by Category for Michigan

Modern Manual

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

High Precipitation

• Add a section that discusses climate change and recommends specific adaptation measures.
• Consider biochar to increase filter permeability.
• Consider carbon footprint when selecting BMP materials.
• Consider future floodplain extent when identifying potential locations for stormwater BMPs.
• Consider increasing the water quality storm depth to capture greater annual runoff volume.
• Enhance quantity sizing standards to consider historic flooding and downstream conditions.
• For water quantity sizing, incorporate projected storm data or other options that account for increased storm depths due to climate change.
• If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
• If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.
• Incorporate additional space around BMPs to provide a right of way for large, intense storms.

Drought

• Add a section that discusses climate change and recommends specific adaptation measures.
• 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.
• Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in rainwater harvesting systems.
• 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.

Sea Level Rise

No Recommendations

Temperature

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

Complete List of Recommendations by Category for Minnesota

Modern Manual

• Reduce the disturbance threshold to less than 1 acre.

High Precipitation

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

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.
• Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in 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.
• Some plants on the landscaping list should be fire-resistant.
• The landscaping section should suggest methods to modify plant selections based on changing climate conditions.

Sea Level Rise

No Recommendations

Temperature

• Consider the carbon footprint of BMP materials.
• Incorporate temperature-resistance standards into BMP materials such as permeable pavement mixes.
• Select light colors for BMP materials such as permeable pavement to provide solar reflection.
• 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.

Complete List of Recommendations by Category for Mississippi

Modern Manual

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

High Precipitation

- Add a section that discusses climate change and recommends specific adaptation measures.
- Consider biochar to increase filter permeability.
- Consider carbon footprint when selecting BMP materials.
- Consider future floodplain extent when identifying potential locations for stormwater BMPs.
- Consider increasing the water quality storm depth to capture greater annual runoff volume.
- 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.
- If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
- If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.
- Incorporate additional space around BMPs to provide a right of way for large, intense storms.

Drought

- Add a section that discusses climate change and recommends specific adaptation measures.
- 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.
- Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in rainwater harvesting systems.
- 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.
- Some plants on the landscaping list should be fire-resistant.

Sea Level Rise

- Add a section that discusses climate change and recommends specific adaptation measures.
- Consider corrosion-resistance when selecting BMP materials.
- Consider future floodplain extent when identifying potential locations for stormwater BMPs.
- Consider salt water intrusion and sea level rise when siting stormwater BMPs.
- Consider the carbon footprint of BMP materials.
- 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.
- Incorporate pumps or other features provide increased head during high tide into the conveyance system.
- Incorporate sizing standards adapted to sea level rise in coastal regions.

Temperature

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

Complete List of Recommendations by Category for Missouri

Modern Manual

• Apply standards statewide.
• Bioretention designs should incorporate internal water storage.
• Develop a state stormwater 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.
• Guidance should include Green Infrastructure practices.
• Include a list of specific stormwater BMPs that are acceptable to meet standards.
• Incorporate a landscaping list into design standards.
• Incorporate channel protection sizing into existing standards
• Incorporate preatreatment into design standards.
• 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.
• Consider biochar to increase filter permeability.
• Consider carbon footprint when selecting BMP materials.
• Consider future floodplain extent when identifying potential locations for stormwater BMPs.
• 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.
• If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
• If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.
• Incorporate additional space around BMPs to provide a right of way for large, intense storms.
• 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.
• 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.
• Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in rainwater harvesting systems.
• 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.

Sea Level Rise

No Recommendations

Temperature

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

Complete List of Recommendations by Category for Montana

Modern Manual

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

High Precipitation

• Add a section that discusses climate change and recommends specific adaptation measures.
• Consider biochar to increase filter permeability.
• Consider carbon footprint when selecting BMP materials.
• Consider future floodplain extent when identifying potential locations for stormwater BMPs.
• 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.
• If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
• If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.
• Incorporate additional space around BMPs to provide a right of way for large, intense storms.
• 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.
• 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.
• Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in rainwater harvesting systems.
• 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.

Sea Level Rise

No Recommendations

Temperature

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

Complete List of Recommendations by Category for Nebraska

Modern Manual

- Adopt specific numeric runoff reduction and water quality sizing standards.
- Apply standards statewide.
- Bioretention designs should incorporate internal water storage.
- Develop a state stormwater 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.
- Guidance should include Green Infrastructure practices.
- Include a list of specific stormwater BMPs that are acceptable to meet standards.
- Incorporate a landscaping list into design standards.
- Incorporate channel protection sizing into existing standards
- Incorporate preatreatment into design standards.

High Precipitation

- Add a section that discusses climate change and recommends specific adaptation measures.
- Consider biochar to increase filter permeability.
- Consider carbon footprint when selecting BMP materials.
- Consider future floodplain extent when identifying potential locations for stormwater BMPs.
- 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.
- If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
- If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.
- Incorporate additional space around BMPs to provide a right of way for large, intense storms.
- 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.
- 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.
- Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in rainwater harvesting systems.
- 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.

Sea Level Rise

No Recommendations

Temperature

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

Complete List of Recommendations by Category for Nevada

Modern Manual

• Adopt specific numeric runoff reduction and water quality sizing standards.
• Apply standards statewide.
• Bioretention designs should incorporate internal water storage.
• Develop a maintenance checklist to guide maintenance activities.
• Develop a state stormwater 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.
• Guidance should include Green Infrastructure practices.
• Include a list of specific stormwater BMPs that are acceptable to meet standards.
• Incorporate a landscaping list into design standards.
• Incorporate channel protection sizing into existing standards

High Precipitation

• Add a section that discusses climate change and recommends specific adaptation measures.
• Consider biochar to increase filter permeability.
• Consider carbon footprint when selecting BMP materials.
• Consider future floodplain extent when identifying potential locations for stormwater BMPs.
• Enhance quantity sizing standards to consider historic flooding and downstream conditions.
• For water quantity sizing, incorporate projected storm data or other options that account for increased storm depths due to climate change.
• If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
• If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.
• Incorporate additional space around BMPs to provide a right of way for large, intense storms.
• 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.
• 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.
• Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in rainwater harvesting systems.
• 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.

Sea Level Rise

No Recommendations

Temperature

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

Complete List of Recommendations by Category for New_Hampshire

Modern Manual

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

High Precipitation

- Add a section that discusses climate change and recommends specific adaptation measures.
- Consider biochar to increase filter permeability.
- Consider carbon footprint when selecting BMP materials.
- Consider future floodplain extent when identifying potential locations for stormwater BMPs.
- Enhance quantity sizing standards to consider historic flooding and downstream conditions.
- For water quantity sizing, incorporate projected storm data or other options that account for increased storm depths due to climate change.
- If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
- If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.
- Incorporate additional space around BMPs to provide a right of way for large, intense storms.
- 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.
- 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.
- Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in rainwater harvesting systems.
- 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.

Sea Level Rise

- Add a section that discusses climate change and recommends specific adaptation measures.
- Consider corrosion-resistance when selecting BMP materials.
- Consider future floodplain extent when identifying potential locations for stormwater BMPs.
- Consider salt water intrusion and sea level rise when siting stormwater BMPs.
- Consider the carbon footprint of BMP materials.
- 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.
- Incorporate pumps or other features provide increased head during high tide into the conveyance system.
- 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.
- Consider the carbon footprint of BMP materials.
- Incorporate specific vegetation targets and/or a tree planting credit into standards.
- Incorporate temperature-resistance standards into BMP materials such as permeable pavement mixes.
- Modify existing water quality sizing to consider downstream ecology and quality.
- Select light colors for BMP materials such as permeable pavement to provide solar reflection.
- 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.

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

• Consider biochar to increase filter permeability.
• Consider carbon footprint when selecting BMP materials.
• Consider future floodplain extent when identifying potential locations for stormwater BMPs.
• Consider increasing the water quality storm depth to capture greater annual runoff volume.
• 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.
• Incorporate additional space around BMPs to provide a right of way for large, intense storms.
• Incorporate Smart BMP Technology into standards and provide recommendations for its use in adapting to changing storm patterns.
• Increase the ponding depth for filtering systems and bioretention to prevent bypass of high intensity storm events.

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.
• Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in rainwater harvesting systems.
• 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.
• Some plants on the landscaping list should be fire-resistant.
• Some plants on the landscaping list should be tolerant to periods of prolonged drought.
• The landscaping section should suggest methods to modify plant selections based on changing climate conditions.

Sea Level Rise

• Consider corrosion-resistance when selecting BMP materials.
• Consider future floodplain extent when identifying potential locations for stormwater BMPs.
• Consider salt water intrusion and sea level rise when siting stormwater BMPs.
• Consider the carbon footprint of BMP materials.
• 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.
• Incorporate pumps or other features provide increased head during high tide into the conveyance system.
• Oversize pipes or open channels to account for lost storage from rising sea levels.
• Provide guidance for converting stormwater BMPs to other practices (e.g., from an infiltration practice to a wetland) in the event of future sea level rise.

Temperature

• Consider the carbon footprint of BMP materials.
• Incorporate specific vegetation targets and/or a tree planting credit into standards.
• Incorporate temperature-resistance standards into BMP materials such as permeable pavement mixes.
• Select light colors for BMP materials such as permeable pavement to provide solar reflection.
• 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.

Complete List of Recommendations by Category for New_Mexico

Modern Manual

• Adopt specific numeric runoff reduction and water quality sizing standards.
• Apply standards statewide.
• Bioretention designs should incorporate internal water storage.
• Develop a maintenance checklist to guide maintenance activities.
• Develop a state stormwater 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.
• Guidance should include Green Infrastructure practices.
• Include a list of specific stormwater BMPs that are acceptable to meet standards.
• Incorporate a landscaping list into design standards.
• Incorporate channel protection sizing into existing standards

High Precipitation

• Consider biochar to increase filter permeability.
• Consider carbon footprint when selecting BMP materials.
• Consider future floodplain extent when identifying potential locations for stormwater BMPs.
• Enhance quantity sizing standards to consider historic flooding and downstream conditions.
• For water quantity sizing, incorporate projected storm data or other options that account for increased storm depths due to climate change.
• If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
• If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.
• Incorporate additional space around BMPs to provide a right of way for large, intense storms.
• Incorporate Smart BMP Technology into standards and provide recommendations for its use in adapting to changing storm patterns.
• Incorporate storms by reference rather than including maps or static images in standards.

Drought

• 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.
• Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in rainwater harvesting systems.
• 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.
• Some plants on the landscaping list should be fire-resistant.

Sea Level Rise

No Recommendations

Temperature

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

Complete List of Recommendations by Category for New_York

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.
• Reduce the disturbance threshold to less than 1 acre.

High Precipitation

• Consider biochar to increase filter permeability.
• Consider carbon footprint when selecting BMP materials.
• Consider increasing the water quality storm depth to capture greater annual runoff volume.
• Enhance quantity sizing standards to consider historic flooding and downstream conditions.
• For water quantity sizing, incorporate projected storm data or other options that account for increased storm depths due to climate change.
• If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
• 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.
• Increase the ponding depth for filtering systems and bioretention to prevent bypass of high intensity storm events.
• Provide a factor of safety when conveying the water quality storm, either by modeling a high-intensity storm or providing supplemental freeboard.

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.
• Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in rainwater harvesting systems.
• Prohibit or restrict the use of practices that consume water (e.g., practices with a permanent pool of water).
• Some plants on the landscaping list should be tolerant to periods of prolonged drought.

Sea Level Rise

• Consider corrosion-resistance when selecting BMP materials.
• Consider salt water intrusion and sea level rise when siting stormwater BMPs.
• Consider the carbon footprint of BMP materials.
• 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.
• Incorporate pumps or other features provide increased head during high tide into the conveyance system.
• Incorporate sizing standards adapted to sea level rise in coastal regions.
• Oversize pipes or open channels to account for lost storage from rising sea levels.
• Provide guidance for converting stormwater BMPs to other practices (e.g., from an infiltration practice to a wetland) in the event of future sea level rise.

Temperature

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

Complete List of Recommendations by Category for North_Carolina

Modern Manual

• Adopt specific numeric runoff reduction and water quality sizing standards.
• Apply standards statewide.
• 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 channel protection sizing into existing standards
• Incorporate specific vegetation targets and/or a tree planting credit into standards.
• 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.

High Precipitation

• Add a section that discusses climate change and recommends specific adaptation measures.
• Consider biochar to increase filter permeability.
• Consider carbon footprint when selecting BMP materials.
• Consider future floodplain extent when identifying potential locations for stormwater BMPs.
• Consider increasing the water quality storm depth to capture greater annual runoff volume.
• Enhance quantity sizing standards to consider historic flooding and downstream conditions.
• For water quantity sizing, incorporate projected storm data or other options that account for increased storm depths due to climate change.
• If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
• If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.
• Incorporate additional space around BMPs to provide a right of way for large, intense storms.

Drought

• Add a section that discusses climate change and recommends specific adaptation measures.
• 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.
• Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in 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.
• Some plants on the landscaping list should be fire-resistant.
• Some plants on the landscaping list should be tolerant to periods of prolonged drought.

Sea Level Rise

• Add a section that discusses climate change and recommends specific adaptation measures.
• Consider corrosion-resistance when selecting BMP materials.
• Consider future floodplain extent when identifying potential locations for stormwater BMPs.
• Consider salt water intrusion and sea level rise when siting stormwater BMPs.
• Consider the carbon footprint of BMP materials.
• 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.
• Incorporate pumps or other features provide increased head during high tide into the conveyance system.
• 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.
• Consider the carbon footprint of BMP materials.
• Incorporate specific vegetation targets and/or a tree planting credit into standards.
• Incorporate temperature-resistance standards into BMP materials such as permeable pavement mixes.
• Modify existing water quality sizing to consider downstream ecology and quality.
• Select light colors for BMP materials such as permeable pavement to provide solar reflection.
• 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.

Complete List of Recommendations by Category for North_Dakota

Modern Manual

• Adopt specific numeric runoff reduction and water quality sizing standards.
• Apply standards statewide.
• Apply standards to redevelopment.
• Bioretention designs should incorporate internal water storage.
• Develop a maintenance checklist to guide maintenance activities.
• Develop a state stormwater 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.
• Guidance should include Green Infrastructure practices.
• Include a list of specific stormwater BMPs that are acceptable to meet standards.

High Precipitation

• Add a section that discusses climate change and recommends specific adaptation measures.
• Consider biochar to increase filter permeability.
• Consider carbon footprint when selecting BMP materials.
• Consider future floodplain extent when identifying potential locations for stormwater BMPs.
• 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.
• If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
• If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.
• Incorporate additional space around BMPs to provide a right of way for large, intense storms.
• Incorporate Smart BMP Technology into standards and provide recommendations for its use in adapting to changing storm

Drought

• Add a section that discusses climate change and recommends specific adaptation measures.
• 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.
• Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in rainwater harvesting systems.
• 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.

Sea Level Rise

No Recommendations

Temperature

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

Complete List of Recommendations by Category for Ohio

Modern Manual

• Adopt specific numeric runoff reduction and water quality sizing 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.
• Incorporate channel protection sizing into existing standards
• Incorporate maintenance into BMP Design Standards.
• Incorporate specific vegetation targets and/or a tree planting credit into standards.
• 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.

High Precipitation

• Add a section that discusses climate change and recommends specific adaptation measures.
• Consider biochar to increase filter permeability.
• Consider carbon footprint when selecting BMP materials.
• Consider future floodplain extent when identifying potential locations for stormwater BMPs.
• Consider increasing the water quality storm depth to capture greater annual runoff volume.
• Enhance quantity sizing standards to consider historic flooding and downstream conditions.
• For water quantity sizing, incorporate projected storm data or other options that account for increased storm depths due to climate change.
• If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
• If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.
• Incorporate additional space around BMPs to provide a right of way for large, intense storms.

Drought

• Add a section that discusses climate change and recommends specific adaptation measures.
• Consider adding polymers designed to retain soil moisture to bioretention specifications.
• Consider the carbon footprint of BMP materials.
• Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in 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.
• Some plants on the landscaping list should be fire-resistant.
• Some plants on the landscaping list should be tolerant to periods of prolonged drought.
• The landscaping section should suggest methods to modify plant selections based on changing climate conditions.

Sea Level Rise

No Recommendations

Temperature

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

Complete List of Recommendations by Category for Oklahoma

Modern Manual

- Adopt specific numeric runoff reduction and water quality sizing standards.
- Apply standards statewide.
- Bioretention designs should incorporate internal water storage.
- Develop a state stormwater 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.
- Include a list of specific stormwater BMPs that are acceptable to meet standards.
- Incorporate a landscaping list into design standards.
- Incorporate channel protection sizing into existing standards
- Incorporate preatreatment into design standards.
- 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.
- Consider biochar to increase filter permeability.
- Consider carbon footprint when selecting BMP materials.
- Consider future floodplain extent when identifying potential locations for stormwater BMPs.
- 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.
- If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
- If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.
- Incorporate additional space around BMPs to provide a right of way for large, intense storms.
- 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.
- 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.
- Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in rainwater harvesting systems.
- 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.

Sea Level Rise

No Recommendations

Temperature

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

Complete List of Recommendations by Category for Oregon

Modern Manual

- Adopt specific numeric runoff reduction and water quality sizing standards.
- Apply standards statewide.
- Incorporate channel protection sizing into existing standards
- Incorporate specific vegetation targets and/or a tree planting credit into standards.
- Provide filter media guidance to prevent clogging and ensure permeability.
- Require Green Infrastructure practices either explicitly or as a means of achieving a goal such as runoff reduction.
- Revise standards to incorporate specific guidance for designing and selecting stormwater BMPs.
- 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.
- Consider biochar to increase filter permeability.
- Consider carbon footprint when selecting BMP materials.
- Consider future floodplain extent when identifying potential locations for stormwater BMPs.
- 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.
- If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.
- Incorporate additional space around BMPs to provide a right of way for large, intense storms.
- Incorporate Smart BMP Technology into standards and provide recommendations for its use in adapting to changing storm patterns.
- Incorporate storms by reference rather than including maps or static images in standards.

Drought

- Add a section that discusses climate change and recommends specific adaptation measures.
- 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.
- Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in rainwater harvesting systems.
- 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.
- Some plants on the landscaping list should be fire-resistant.

Sea Level Rise

- Add a section that discusses climate change and recommends specific adaptation measures.
- Consider corrosion-resistance when selecting BMP materials.
- Consider future floodplain extent when identifying potential locations for stormwater BMPs.
- Consider salt water intrusion and sea level rise when siting stormwater BMPs.
- Consider the carbon footprint of BMP materials.
- 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.
- Incorporate pumps or other features provide increased head during high tide into the conveyance system.
- Incorporate sizing standards adapted to sea level rise in coastal regions.

Temperature

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

Complete List of Recommendations by Category for Pennsylvania

Modern Manual

• Reduce the disturbance threshold to less than 1 acre.

High Precipitation

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

Drought

• Consider adding polymers designed to retain soil moisture to bioretention specifications.
• Consider the carbon footprint of BMP materials.
• Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in 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.

Sea Level Rise

• Consider salt water intrusion and sea level rise when siting stormwater BMPs.
• Consider the carbon footprint of BMP materials.
• 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.
• Incorporate pumps or other features provide increased head during high tide into the conveyance system.
• Incorporate sizing standards adapted to sea level rise in coastal regions.
• Oversize pipes or open channels to account for lost storage from rising sea levels.
• Provide guidance for converting stormwater BMPs to other practices (e.g., from an infiltration practice to a wetland) in the event of future sea level rise.
• Revise standards to incorporate a reserve area or future practice expansion to accommodate sea level rise.

Temperature

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

Complete List of Recommendations by Category for Rhode_Island

Modern Manual

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

High Precipitation

• Consider biochar to increase filter permeability.
• Consider carbon footprint when selecting BMP materials.
• Consider future floodplain extent when identifying potential locations for stormwater BMPs.
• Consider increasing the water quality storm depth to capture greater annual runoff volume.
• Enhance the existing climate change section to recommend specific adaptation measures.
• If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
• If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.
• Incorporate additional space around BMPs to provide a right of way for large, intense storms.
• Incorporate Smart BMP Technology into standards and provide recommendations for its use in adapting to changing storm patterns.
• Incorporate storms by reference rather than including maps or static images in standards.

Drought

• 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.
• Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in rainwater harvesting systems.
• 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.

Sea Level Rise

• Consider corrosion-resistance when selecting BMP materials.
• Consider future floodplain extent when identifying potential locations for stormwater BMPs.
• Consider salt water intrusion and sea level rise when siting stormwater BMPs.
• Consider the carbon footprint of BMP materials.
• 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.
• Incorporate pumps or other features provide increased head during high tide into the conveyance system.
• Incorporate sizing standards adapted to sea level rise in coastal regions.
• Oversize pipes or open channels to account for lost storage from rising sea levels.

Temperature

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

Complete List of Recommendations by Category for South_Carolina

Modern Manual

- Apply standards statewide.
- Bioretention designs should incorporate internal water storage.
- Develop a maintenance checklist to guide maintenance activities.
- Incorporate a landscaping list into design standards.
- Incorporate channel protection sizing into existing standards
- Incorporate specific vegetation targets and/or a tree planting credit into standards.
- Reduce the disturbance threshold to less than 1 acre.
- Review and update existing design 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.
- Consider biochar to increase filter permeability.
- Consider carbon footprint when selecting BMP materials.
- Consider future floodplain extent when identifying potential locations for stormwater BMPs.
- 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.
- If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
- If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.
- Incorporate additional space around BMPs to provide a right of way for large, intense storms.
- 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.
- 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.
- Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in rainwater harvesting systems.
- 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.
- Some plants on the landscaping list should be fire-resistant.

Sea Level Rise

- Add a section that discusses climate change and recommends specific adaptation measures.
- Consider corrosion-resistance when selecting BMP materials.
- Consider future floodplain extent when identifying potential locations for stormwater BMPs.
- Consider salt water intrusion and sea level rise when siting stormwater BMPs.
- Consider the carbon footprint of BMP materials.
- 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.
- Incorporate pumps or other features provide increased head during high tide into the conveyance system.
- Incorporate sizing standards adapted to sea level rise in coastal regions.

Temperature

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

Complete List of Recommendations by Category for South_Dakota

Modern Manual

- Adopt specific numeric runoff reduction and water quality sizing standards.
- Apply standards statewide.
- Bioretention designs should incorporate internal water storage.
- Develop a maintenance checklist to guide maintenance activities.
- Develop a state stormwater 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.
- Guidance should include Green Infrastructure practices.
- Include a list of specific stormwater BMPs that are acceptable to meet standards.
- Incorporate a landscaping list into design standards.
- Incorporate channel protection sizing into existing standards

High Precipitation

- Add a section that discusses climate change and recommends specific adaptation measures.
- Consider biochar to increase filter permeability.
- Consider carbon footprint when selecting BMP materials.
- Consider future floodplain extent when identifying potential locations for stormwater BMPs.
- Enhance quantity sizing standards to consider historic flooding and downstream conditions.
- For water quantity sizing, incorporate projected storm data or other options that account for increased storm depths due to climate change.
- If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
- If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.
- Incorporate additional space around BMPs to provide a right of way for large, intense storms.
- 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.
- 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.
- Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in rainwater harvesting systems.
- 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.

Sea Level Rise

No Recommendations

Temperature

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

Complete List of Recommendations by Category for Tennessee

Modern Manual

- Apply standards statewide.
- Incorporate channel protection sizing into existing standards
- Reduce the disturbance threshold to less than 1 acre.
- 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.
- Consider biochar to increase filter permeability.
- Consider carbon footprint when selecting BMP materials.
- Consider future floodplain extent when identifying potential locations for stormwater BMPs.
- 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.
- If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
- If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.
- Incorporate additional space around BMPs to provide a right of way for large, intense storms.
- 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.
- 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.
- Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in 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.
- Some plants on the landscaping list should be fire-resistant.

Sea Level Rise

No Recommendations

Temperature

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

Complete List of Recommendations by Category for Texas

Modern Manual

- Adopt specific numeric runoff reduction and water quality sizing standards.
- Apply standards statewide.
- Bioretention designs should incorporate internal water storage.
- Develop a maintenance checklist to guide maintenance activities.
- Develop a state stormwater 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.
- Guidance should include Green Infrastructure practices.
- Include a list of specific stormwater BMPs that are acceptable to meet standards.
- Incorporate a landscaping list into design standards.
- Incorporate channel protection sizing into existing standards

High Precipitation

- Add a section that discusses climate change and recommends specific adaptation measures.
- Consider biochar to increase filter permeability.
- Consider carbon footprint when selecting BMP materials.
- Consider future floodplain extent when identifying potential locations for stormwater BMPs.
- Enhance quantity sizing standards to consider historic flooding and downstream conditions.
- For water quantity sizing, incorporate projected storm data or other options that account for increased storm depths due to climate change.
- If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
- If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.
- Incorporate additional space around BMPs to provide a right of way for large, intense storms.
- 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.
- 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.
- Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in rainwater harvesting systems.
- 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.

Sea Level Rise

- Add a section that discusses climate change and recommends specific adaptation measures.
- Consider corrosion-resistance when selecting BMP materials.
- Consider future floodplain extent when identifying potential locations for stormwater BMPs.
- Consider salt water intrusion and sea level rise when siting stormwater BMPs.
- Consider the carbon footprint of BMP materials.
- 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.
- Incorporate pumps or other features provide increased head during high tide into the conveyance system.
- Incorporate sizing standards adapted to sea level rise in coastal regions.

Temperature

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

Complete List of Recommendations by Category for Utah

Modern Manual

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

High Precipitation

• Add a section that discusses climate change and recommends specific adaptation measures.
• Consider biochar to increase filter permeability.
• Consider carbon footprint when selecting BMP materials.
• Consider future floodplain extent when identifying potential locations for stormwater BMPs.
• 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.
• If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
• If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.
• Incorporate additional space around BMPs to provide a right of way for large, intense storms.
• 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.
• 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.
• Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in 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.
• Some plants on the landscaping list should be fire-resistant.

Sea Level Rise

No Recommendations

Temperature

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

Complete List of Recommendations by Category for Vermont

Modern Manual

- Bioretention designs should incorporate internal water storage.
- 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.
- Consider biochar to increase filter permeability.
- Consider carbon footprint when selecting BMP materials.
- Consider future floodplain extent when identifying potential locations for stormwater BMPs.
- Consider increasing the water quality storm depth to capture greater annual runoff volume.
- Enhance quantity sizing standards to consider historic flooding and downstream conditions.
- For water quantity sizing, incorporate projected storm data or other options that account for increased storm depths due to climate change.
- If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
- If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.
- Incorporate additional space around BMPs to provide a right of way for large, intense storms.

Drought

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

Sea Level Rise

No Recommendations

Temperature

- Add a section that discusses climate change and recommends specific adaptation measures.
- Consider the carbon footprint of BMP materials.
- Incorporate temperature-resistance standards into BMP materials such as permeable pavement mixes.
- Select light colors for BMP materials such as permeable pavement to provide solar reflection.
- 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.

Complete List of Recommendations by Category for Virginia

Modern Manual

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

High Precipitation

- Consider biochar to increase filter permeability.
- Consider carbon footprint when selecting BMP materials.
- Consider increasing the water quality storm depth to capture greater annual runoff volume.
- 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.
- If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
- If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.
- Incorporate additional space around BMPs to provide a right of way for large, intense storms.
- Incorporate Smart BMP Technology into standards and provide recommendations for its use in adapting to changing storm patterns.
- Increase the ponding depth for filtering systems and bioretention to prevent bypass of high intensity storm events.

Drought

- 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.
- Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in 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.
- Some plants on the landscaping list should be fire-resistant.
- Some plants on the landscaping list should be tolerant to periods of prolonged drought.
- The landscaping section should suggest methods to modify plant selections based on changing climate conditions.

Sea Level Rise

- Consider corrosion-resistance when selecting BMP materials.
- Consider salt water intrusion and sea level rise when siting stormwater BMPs.
- Consider the carbon footprint of BMP materials.
- Enhance the existing climate change section to recommend specific adaptation measures.
- 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.
- Provide guidance for converting stormwater BMPs to other practices (e.g., from an infiltration practice to a wetland) in the event of future sea level rise.
- Revise standards to incorporate a reserve area or future practice expansion to accommodate sea level rise.
- Revise stormwater BMP siting standards to incorporate sea level rise.
- Some plants on the landscaping list should be salt-tolerant.

Temperature

- Consider the carbon footprint of BMP materials.
- Incorporate temperature-resistance standards into BMP materials such as permeable pavement mixes.
- Select light colors for BMP materials such as permeable pavement to provide solar reflection.
- 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.

Complete List of Recommendations by Category for Washington

Modern Manual

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

High Precipitation

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

Drought

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

Sea Level Rise

- Consider corrosion-resistance when selecting BMP materials.
- Consider salt water intrusion and sea level rise when siting stormwater BMPs.
- Consider the carbon footprint of BMP materials.
- Elevate outfall inverts to the level of the projected high tide.
- 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.
- Oversize pipes or open channels to account for lost storage from rising sea levels.
- Provide guidance for converting stormwater BMPs to other practices (e.g., from an infiltration practice to a wetland) in the event of future sea level rise.
- Revise standards to incorporate a reserve area or future practice expansion to accommodate sea level rise.
- Revise stormwater BMP siting standards to incorporate sea level rise.

Temperature

- Consider the carbon footprint of BMP materials.
- Incorporate specific vegetation targets and/or a tree planting credit into standards.
- Incorporate temperature-resistance standards into BMP materials such as permeable pavement mixes.
- Select light colors for BMP materials such as permeable pavement to provide solar reflection.
- 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.

Complete List of Recommendations by Category for West_Virginia

Modern Manual

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

High Precipitation

- Add a section that discusses climate change and recommends specific adaptation measures.
- Consider biochar to increase filter permeability.
- Consider carbon footprint when selecting BMP materials.
- Consider future floodplain extent when identifying potential locations for stormwater BMPs.
- Enhance quantity sizing standards to consider historic flooding and downstream conditions.
- For water quantity sizing, incorporate projected storm data or other options that account for increased storm depths due to climate change.
- If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
- If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.
- Incorporate additional space around BMPs to provide a right of way for large, intense storms.
- 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.
- 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.
- Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in 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).
- Some plants on the landscaping list should be fire-resistant.
- The landscaping section should suggest methods to modify plant selections based on changing climate conditions.

Sea Level Rise

No Recommendations

Temperature

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

Complete List of Recommendations by Category for Wisconsin

Modern Manual

- Adopt specific numeric runoff reduction and water quality sizing standards.
- Bioretention designs should incorporate internal water storage.
- Develop a maintenance checklist to guide maintenance activities.
- Incorporate a landscaping list into design standards.
- Incorporate channel protection sizing into existing standards
- Incorporate specific vegetation targets and/or a tree planting credit into standards.
- Provide filter media guidance to prevent clogging and ensure permeability.
- 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.
- Update design storms to reference the most recent available storm data.

High Precipitation

- Add a section that discusses climate change and recommends specific adaptation measures.
- Consider biochar to increase filter permeability.
- Consider carbon footprint when selecting BMP materials.
- Consider future floodplain extent when identifying potential locations for stormwater BMPs.
- 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.
- If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
- If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.
- Incorporate additional space around BMPs to provide a right of way for large, intense storms.
- 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.
- 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.
- Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in rainwater harvesting systems.
- 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.

Sea Level Rise

No Recommendations

Temperature

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

Complete List of Recommendations by Category for Wyoming

Modern Manual

- Adopt specific numeric runoff reduction and water quality sizing standards.
- Apply standards statewide.
- Apply standards to redevelopment.
- Bioretention designs should incorporate internal water storage.
- Develop a maintenance checklist to guide maintenance activities.
- Develop a state stormwater 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.
- Guidance should include Green Infrastructure practices.
- Include a list of specific stormwater BMPs that are acceptable to meet standards.
- Incorporate a landscaping list into design standards.

High Precipitation

- Add a section that discusses climate change and recommends specific adaptation measures.
- Consider biochar to increase filter permeability.
- Consider carbon footprint when selecting BMP materials.
- Consider future floodplain extent when identifying potential locations for stormwater BMPs.
- Enhance quantity sizing standards to consider historic flooding and downstream conditions.
- For water quantity sizing, incorporate projected storm data or other options that account for increased storm depths due to climate change.
- If continuous modeling is used to establish quantity goals, incorporate future projected storm data.
- If flow-based pretreatment measures are utilized, select treatment units using conservative assumptions regarding storm intensity.
- Incorporate additional space around BMPs to provide a right of way for large, intense storms.
- 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.
- 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.
- Incorporate Smart BMP Technology into standards and provide recommendations for its use in maximizing use of water in rainwater harvesting systems.
- 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.

Sea Level Rise

No Recommendations

Temperature

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