



# STATE WATER PLAN REVIEW

May 2021

# TABLE OF CONTENTS

<b>03</b>	Executive Summary	<b>12</b>	Texas
<b>04</b>	Climate and Drought	<b>13</b>	Utah
<b>05</b>	Arkansas	<b>14</b>	Virginia
<b>06</b>	California	<b>15</b>	West Virginia
<b>07</b>	Colorado	<b>16</b>	Great Lakes Commission
<b>08</b>	Connecticut	<b>17</b>	Potomac River Basin
<b>09</b>	Illinois	<b>18</b>	Observations & Conclusions
<b>10</b>	Indiana	<b>19</b>	Appendices
<b>11</b>	Michigan		

# EXECUTIVE SUMMARY

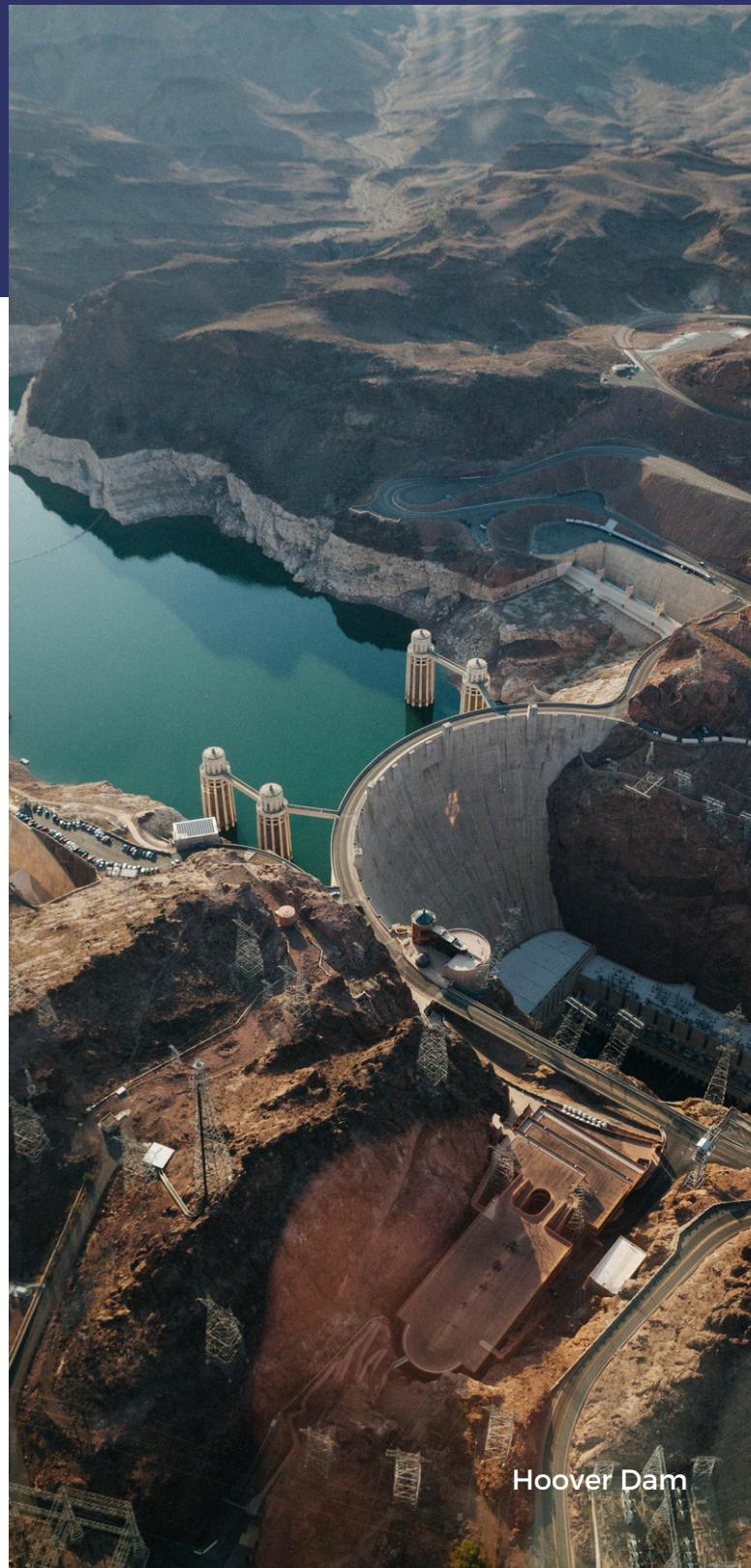
## Overview

The 2021 State Water Plan Review provides an overview of 11 state water plans and 2 interstate water plans with a specific focus on climate and drought. This report identifies the driving forces behind state water planning and the goals of engaging in the planning process. It also highlights the ways in which states incorporate drought and climate change into their plans.

States were selected based on our general interest with an effort to provide a balance between western and eastern states. We wanted to illustrate water plans that focused on water scarcity and those that focused on general planning for water supply.

## Acknowledgements

This report was completed for the Water Planning Committee as part of ICWP's Spring 2021 Internship Program. We relied on publicly available state water plans to conduct our review. Appendix A provides a list of links to each state's water plan.



# DROUGHT AND CLIMATE

We used four specific questions to characterize state's approaches to water resources planning in the context of climate and drought (see table below):

- Does the state have a standalone climate plan?
- Does the state incorporate climate into its water plan?
- Does the state have a standalone drought plan?
- Does the state incorporate drought into its water plan?

Standalone drought plans and climate change plans are included in Appendices B & C.

	Incorporate climate?	Incorporate drought?	Standalone climate plan?	Standalone drought plan?
Arkansas	No	Yes	No	No
California	Yes	Yes	Yes	Yes
Colorado	Yes	Yes	Yes	Yes
Connecticut	Yes	Yes	Yes	Yes
Illinois	Yes	Yes	No	Yes
Indiana	No	No	No	Yes
Michigan	Yes	Yes	No	Yes
Texas	No	Yes	No	No
Utah	No	Yes	No	Yes
Virginia	Yes	Yes	Yes	Yes
West Virginia	No	Yes	No	Yes



Lake Ouachita, AR

# ARKANSAS

## Drivers

While Arkansas considers itself a "water-rich" state and is not planning for any general water scarcity, the Plan addresses groundwater declines.

## Drought & Climate Change

The plan led to the formation of the Drought Contingency Response Network; a group tasked with reviewing drought mitigation plans from other states. Developing a standalone drought plan is not an explicit part of the group's mandate.

The plan does not discuss climate change or variability except to note its potential effects on the state, including an increase in extreme weather events and potential saltwater intrusion.

## Goals

The primary goal of the plan is to meet the drinking water needs of the state. The plan also identifies gaps between water supply and demand and makes recommendations on how to reduce them. Additionally, it enumerates six focus areas including providing direction for regional water management and adding and maintaining crucial water infrastructure.

The plan also includes a report card that tracks progress on each goal and serves as a template for the next water plan.



Santa Maria, CA

# CALIFORNIA

## Drivers

The California Water Plan Update 2018 recognizes that the state's water resources are becoming increasingly vulnerable and that California needs to plan for sustainability. Water resource issues continue to be exacerbated by climate change.

## Drought & Climate Change

Climate change will continue to exacerbate floods and drought, increasing the potential for more extreme events across the state. The plan pays special attention to vulnerable communities who are more susceptible to the effects of extreme weather events.

## Goals

The primary goals of The Plan are to improve integrated watershed management, strengthen resiliency of existing and future infrastructure, restore critical ecosystems, empower California's vulnerable communities, improve inter-agency alignment and support adaptive management and long-term planning.

The state plan also provides a map that illustrates the regional differences in water supply. Northern California tends to get its water from instream environmental and recycled water supplies while southern California is more reliant on the Colorado River and other state and federal projects.



Maroon Bells, CO

# COLORADO

## Drivers

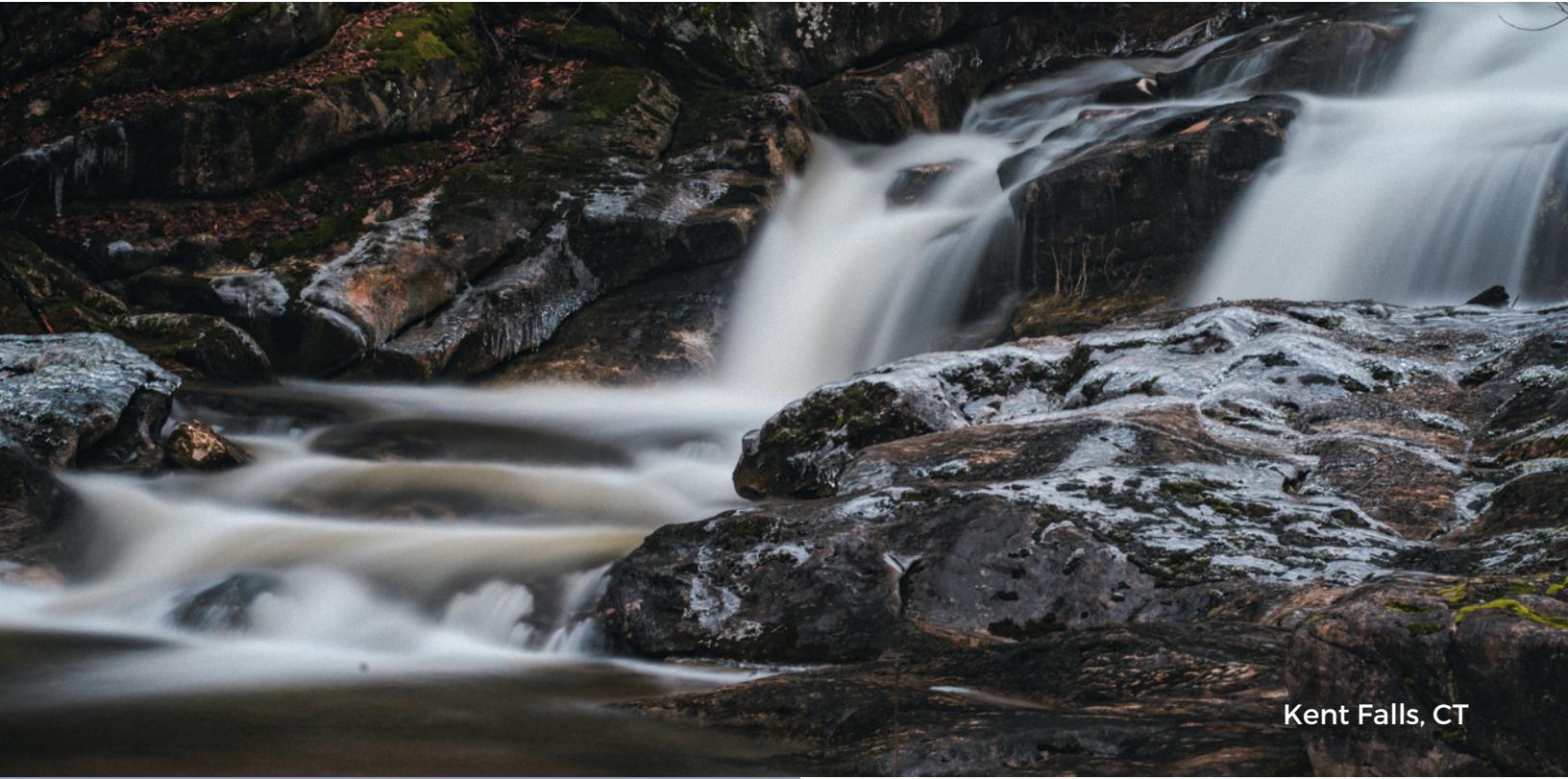
Colorado's state water plan is driven by the need to sustain a growing population. It also aims to preserve its extensive landscape and wildlife.

## Drought & Climate Change

Beyond policy recommendations and specific actions, the plan also outlines educational goals around climate change. This is prioritized in order to maintain momentum in working towards sustainable water supply. Drought is discussed extensively throughout the plan, especially as the state is likely to experience more extreme shortages as a result of climate change. Droughts have a number of negative impacts, including increased wildfire potential and decline in economic activity.

## Goals

In its fifth year, the water plan focuses significantly on response to shifts in supply as a result of climate change. The plan serves to identify risk and predict basin volumes and usage. It features the analysis of five scenarios of water supply to evaluate risk to the agricultural, municipal, industrial, and recreation sectors, with policy recommendations and specific action in response.



Kent Falls, CT

# CONNECTICUT

## Drivers

In the State Water Plan, Connecticut acknowledges that the state enjoys clean, plentiful water. An increased awareness about drought and planning for adaptation to climate trends factored into the development of this version.

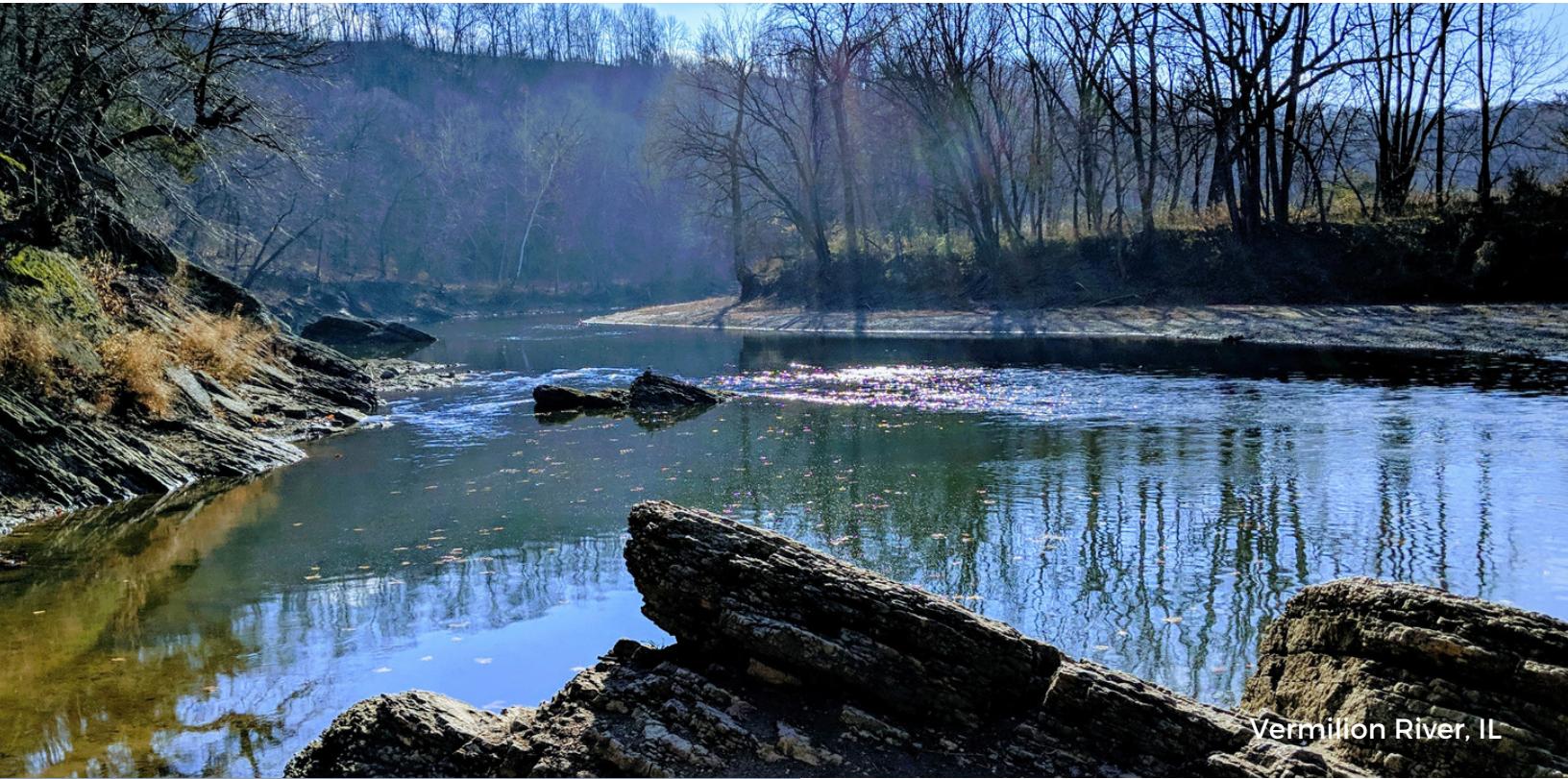
## Drought & Climate Change

The plan acknowledges that while climate change is not necessarily a threat to Connecticut's water resources, it is important for the state to understand and incorporate climate change impacts into planning. The plan includes a climate change technical analysis using potential ranges of monthly precipitation, temperatures, and streamflow. Connecticut developed and adopted its first drought plan in 2003.

The state published an updated version of its Drought Plan in 2016. The update provided further clarity on drought stage nomenclature and emphasized that drought can occur in any geographic region of the state. The most recent drought plan was published in 2018.

## Goals

The primary goal of the State Water Plan was to balance the use of water to meet all needs. Other goals included promoting public health and protecting the environment. Connecticut also used The Plan to create a repository for scientific information and to involve its citizens in water management decisions.



Vermilion River, IL

# ILLINOIS

## Drivers

Illinois' state water plan aims to provide guidance for state, local, and non-governmental officials pertaining to water resource related planning. The plan's main drivers are water resource protection and quality control for the purpose of future utilization and recreation and bolstering state planning against potential climate variation.

## Drought & Climate Change

Emergency planning for drought is included in the water plan. Because the plan was released in 1984 (and is currently being re-done in 2021) climate change was not a central focus, though there was mention of potential atmospheric changes,

The state has expressed that climate change related planning will be a central focus of the new version.

## Goals

The goals of Illinois' Water Plan are to control erosion and sedimentation, protect groundwater resources, mitigate flood damage, protect recreation, plan for drought and potential long term atmospheric changes caused by climate change.

Illinois' Water Plan was created in 1967 and has been periodically edited, with the most recent major overhaul finished in 1994. The State is convening public virtual meetings in late May 2021 to hear comments on a new 2021 update to the plan.



Columbus, IN

# INDIANA

## Drivers

Indiana's Water Shortage Plan began after the drought of 1988, when the disaster exposed the need to prepare for future destruction. Last updated in 2015, the plan is driven by the continued need to optimize the response to drought.

## Drought & Climate Change

The plan only discusses immediate response to severe drought. However, the plan identifies that efficient water supply planning needs to take place to mitigate the onset of crisis.

## Goals

The drought plan serves to identify how to predict shortage, prioritize uses during times of shortage, and assess groundwater provisions, to ensure the security of Indiana residents' access to water. While it identifies response to localized water shortages as a result of isolated events, its main goal lies in addressing the regional shortages that come as a result.



Upper Peninsula, MI

# MICHIGAN

## Drivers

Michigan's State Water Plan, called The Michigan Water Strategy, is driven by concerns over drought planning and water scarcity, with a central focus on preserving the Great Lakes for both recreation, resource utilization, and natural beauty.

## Drought & Climate Change

Michigan's proximity to the Great Lakes and abundant freshwater are a constant focus of the Water Strategy. Climate change and drought are mentioned extensively throughout the plan because of the potential for a decline in regional precipitation.

## Goals

Michigan's Plan features five explicitly stated goals: ensure safe drinking water, achieve a 40% reduction in phosphorus in the Western Lake Erie Basin, prevent the introduction of new aquatic invasive species and control established populations, support investments in commercial and recreational harbors, and develop and implement a water trails system.



Austin, TX

# TEXAS

## Drivers

The 2017 State Water Plan focuses on addressing the gap between existing water supply and future water demand in the context of the pressures of population growth.

## Drought & Climate Change

This is the first year that Texas has incorporated drought response into their state water plan. Each regional water plan must also include a separate chapter on drought. Although the plan rarely explicitly addresses "climate", it discusses the variability and uncertainty of future water supply and demand.

## Goals

The Plan is a guide to state water policy that includes legislative recommendations and proposed water management strategies. It provides an understanding of water availability and water supply within the state and incentivizes stakeholder participation. Texas employs a bottom-up approach, allowing regional water management groups to develop their own strategies.

The Plan also serves as a progress report and an update to previous plans.



Zion National Park, UT

# UTAH

## Drivers

Given that water demand will soon exceed water supply, Utah's plan illustrates the importance of incorporating water scarcity into planning for water resources. The state is also interested in safeguarding existing water supplies and mitigating the impacts of drought.

## Drought & Climate Change

The plan discusses the impacts of the state's semiarid climate on water supply but does not explicitly address "climate change". The plan acknowledges the variability of climate including droughts and floods and highlights the important role of water storage in mitigating the impact of these events.

## Goals

Utah's plan seeks to guide water planning efforts and management strategies with an emphasis on supporting local leaders. The plan also provides information for the general public and includes a discussion of current and future development projects.

Additionally, the plan emphasizes the urgency of water conservation and the importance of pairing conservation with development to meet the state's future water supply needs.



Virginia Beach, VA

# VIRGINIA

## Drivers

Although Virginia has a standalone climate plan, coastal and inland water resource resiliency in the face of changing climate is a key driver of the state's Water Plan.

## Drought & Climate Change

The plan has a central, climate-change focused analysis regarding protecting watershed services such as providing waste assimilation, fish and wildlife habitat, and water for other existing downstream withdrawals. The analysis relies heavily on various datasets, drawing on past annual water withdrawal reporting, permitting, and discharge permitting, and incorporating long term modeling.

## Goals

The State Plan takes an extensive look at surface water and groundwater resources and includes an assessment of the capacity of these resources to meet the projected future water needed by each locality in 2040.

Localities submit water availability data to the state DEQ every five years, which is then compiled into a new version of the Water Plan. Because of the emphasis on local information and modeling, the plan is altogether very data-driven.



Babcock State Park, WV

# WEST VIRGINIA

## Drivers

West Virginia's Water Plan focuses on future quantity projections of available surface and groundwater resources through the lens of consumptive human industrial use. The plan emphasizes West Virginia's ample water availability and encourages investment in increased monitoring, technology, and infrastructure.

## Drought & Climate Change

Although West Virginia's Water Plan does not explicitly cite climate change, it does include a section titled "Impact of Anthropogenic Activities on Low Flow in West Virginia" that explores human-designed land use changes including deforestation and a general increase in impervious surfaces that have impacted modern stream flow.

## Goals

West Virginia's Water Plan "details past flooding and drought in the state, examines water infrastructure needs, describes the need for continued stream gaging and includes projections of future water use." Additionally, the plan urges increased data collection and stream flow and water quality reporting.



Detroit, MI

## GREAT LAKES COMMISSION

### Drivers

The Commission lists a number of drivers for planning for water resources including water quality, commercial navigation, economic development, coastal conservation and habitat restoration, and information management.

### Drought & Climate Change

The GLC's "Joint Action Plan for Clean Water Infrastructure and Services in the Great Lakes Region" differs from other water plans in that the economic motivations tied to watershed protection are the most evident driver. Neither climate change nor drought are mentioned in the plan explicitly.

### Goals

The [Great Lakes Commission Strategic Plan](#) is a statement of vision, mission, goals, objectives and strategic actions to guide the work of the Great Lakes Commission.

The Strategic Plan functions as a framing document, designed to be updated every five years, that encourages regional perspective, collaboration, and transparency in the work of the Commission.



Great Falls, Potomac, VA

## INTERSTATE COMMISSION ON THE POTOMAC RIVER BASIN

### Drivers

The Potomac Basin Comprehensive Water Resources Plan is driven by a desire to have interstate understanding of basin-wide water issues and a comprehensive plan for addressing concerns. It is a science-forward, data-driven summary document that lays out broad goals for management of the river.

### Drought & Climate Change

Climate change is a central driver of the Water Resources Plan and is mentioned not only in a designated section but as a consideration in many of the plan's chapters. Past devastating droughts are cited in the plan and examined under an emergency planning lens.

### Goals

The Potomac Basin Comprehensive Water Resources Plan describes a shared vision for the basin, and aims to identify and develop management recommendations for water resources issues of interstate and/or basin-wide significance. It aims to facilitate achievement of common goals, including protection of water supplies, drinking water sources, water quality, and aquatic life.

# OBSERVATIONS AND CONCLUSIONS

All states are at different planning stages for water resources and creating a statewide plan is a time-intensive process. For example, Illinois last published a comprehensive water plan in 1984, with a companion document on remaining issues published in 1994. The state is currently working on a revised state water plan. Although Utah's State Water Plan hasn't been updated since 2001, the state is working on an overhaul. In the interim, Utah has published other reports including an analysis of climate change adaptation strategies, although the state has not gone so far as to develop a standalone climate change plan.

Many states share similar goals for developing state water plans, including setting funding priorities, providing guidance for regional and local water planners, developing an inclusive process for stakeholder participation, and creating a repository for water data.

In looking at drought, we found it was important to differentiate between mitigation and response. Some states focused on short-term immediate solutions to water shortages while others explored ways in which to plan for and lessen the impacts of future drought. The majority of states we reviewed incorporated drought to some extent in their plans.

States addressed climate change in myriad ways in their state water plans. We found that some states merely focus on the physical climate of their states, with the occasional mention of how that climate may be shifting. Others prefer to use different terms for climate change, such as "variability". States that include a robust discussion of climate change in their water plans tend to focus on the increase in extreme events or other ways in which physical climate, such as precipitation and temperature, will shift.

Finally, we noted that states occasionally employ consulting firms to draft their state water plans. Of the 11 state and 2 interstate water plans we reviewed, only Connecticut contracted a consulting firm to develop their water plan.

# **APPENDIX A:**

## **STATE WATER PLANS**

- [Arkansas Water Plan Update](#) (2014)
- [Colorado Water Plan](#) (2015)
- [California Water Plan Update](#) (2018)
- [Connecticut State Water Plan](#) (2018)
- [Illinois State Water Plan](#) (1984, pending 2021 update)
- [Indiana's Water Shortage Plan](#) (2015)
- [Michigan Water Strategy](#) (2016)
- [Texas State Water Plan](#) (2017)
- [Utah State Water Plan](#) (2001)
- [Virginia Water Resources Plan](#) (2015)
- [West Virginia Water Resources Management Plan](#) (2013)
- [Great Lakes Commission Joint Action Plan](#) (2017)
- [Potomac Basin Comprehensive Water Resources Plan](#) (2018)

## **APPENDIX B: STATE DROUGHT PLANS**

- [California Drought Contingency Plan](#) (2010)
- [Colorado Drought Mitigation and Response Plan](#) (2018)
- [Connecticut State Drought Preparedness & Response Plan](#) (2018)
- [Illinois Drought Preparedness and Response Plan](#) (2011)
- [Indiana's Water Shortage Plan](#) (2015)
- [Michigan Hazard Mitigation Plan](#) (2014)
- [Utah Drought Response Plan](#) (2013)
- [Virginia Drought Response and Assessment Plan](#) (2003)
- [West Virginia Emergency Operations Plan](#) (2016)

## **APPENDIX C:**

### **STATE CLIMATE CHANGE PLANS**

- [California DWR Climate Action Plan](#) (2018)
- [Colorado Climate Plan](#) (2018)
- [Connecticut Climate Change Preparedness Plan](#) (2011)
- [Virginia Climate Change Action Plan](#) (2008)