



MISSOURI

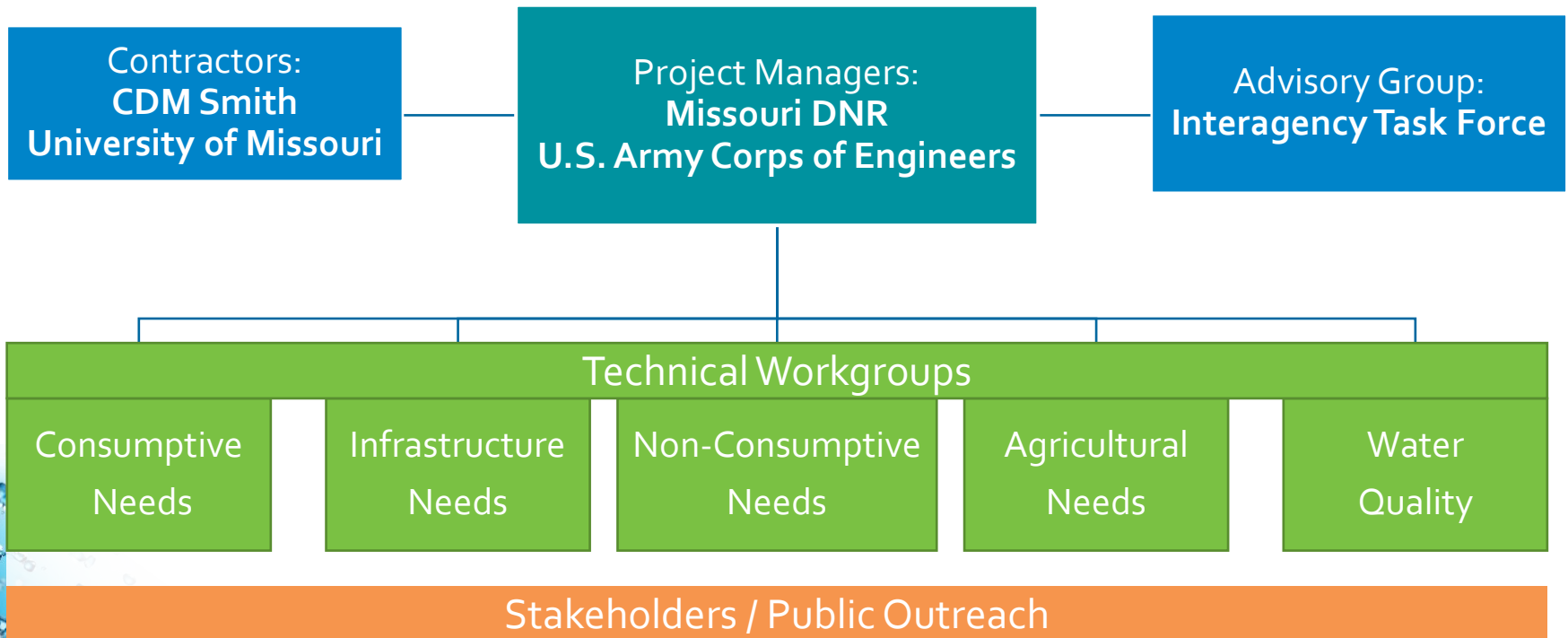
WATER RESOURCES PLAN

Missouri Water Resources Plan

Statutory Responsibility (640.415 RSMo):

“The department shall develop, maintain and periodically update a state water plan for a long-range, comprehensive statewide program for the use of surface water and groundwater resources of the state, including existing and future need for drinking water supplies, agriculture, industry, recreation, environmental protection and related needs.”

Missouri Water Resources Plan Team



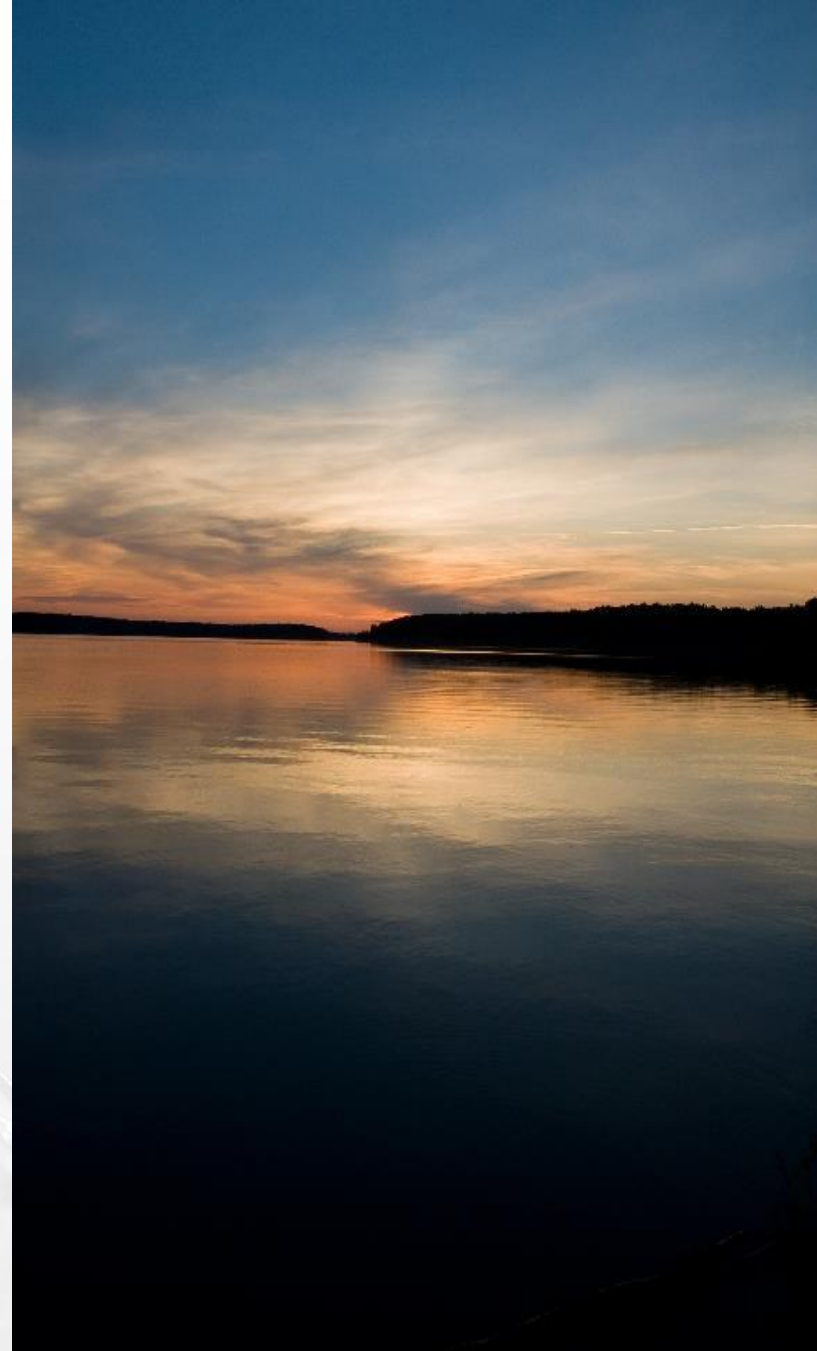
Water Plan Goals

- Provide an updated evaluation of current and future water use needs.
- Provide an updated evaluation of current and future water supply and availability.
- Identify shortfalls in water supply or infrastructure needs.



Water Plan Goals

- Understand areas where developing new or more sustainable water sources, better infrastructure, and more integrated water supplies will provide an adequate supply of water resources to meet the need of Missourians now and in the future.



Elements of the Water Plan

- Develop estimates of water needs for all sectors of water use
- Assess water supplies
- Assess water quality as it affects water use availability
- Identify infrastructure needs, costs and financing
- Gather public and stakeholder input



Water Plan Core Elements: Demands

WATER DEMAND SECTORS

Demands

Supply

Infrastructure

Water Quality

Public and
Stakeholder
Involvement

Consumptive Demand

- Municipally-Provided Public Supply
- Self-Supplied Nonresidential
- Self-Supplied Domestic
- Livestock
- Agriculture Irrigation

Non-Consumptive Demand

- Hydroelectric Power Generation
- Commercial Navigation
- Fisheries and Wetlands
- Water-Based Outdoor Recreation
- Thermoelectric Power Generation (small portion consumed)

Consumptive demand refers to water that is withdrawn from the source and consumed in a way that makes its use all or partially unavailable for other purposes or uses

Determining Agriculture Needs

University of Missouri is Leading the Assessment

Overall Objectives:

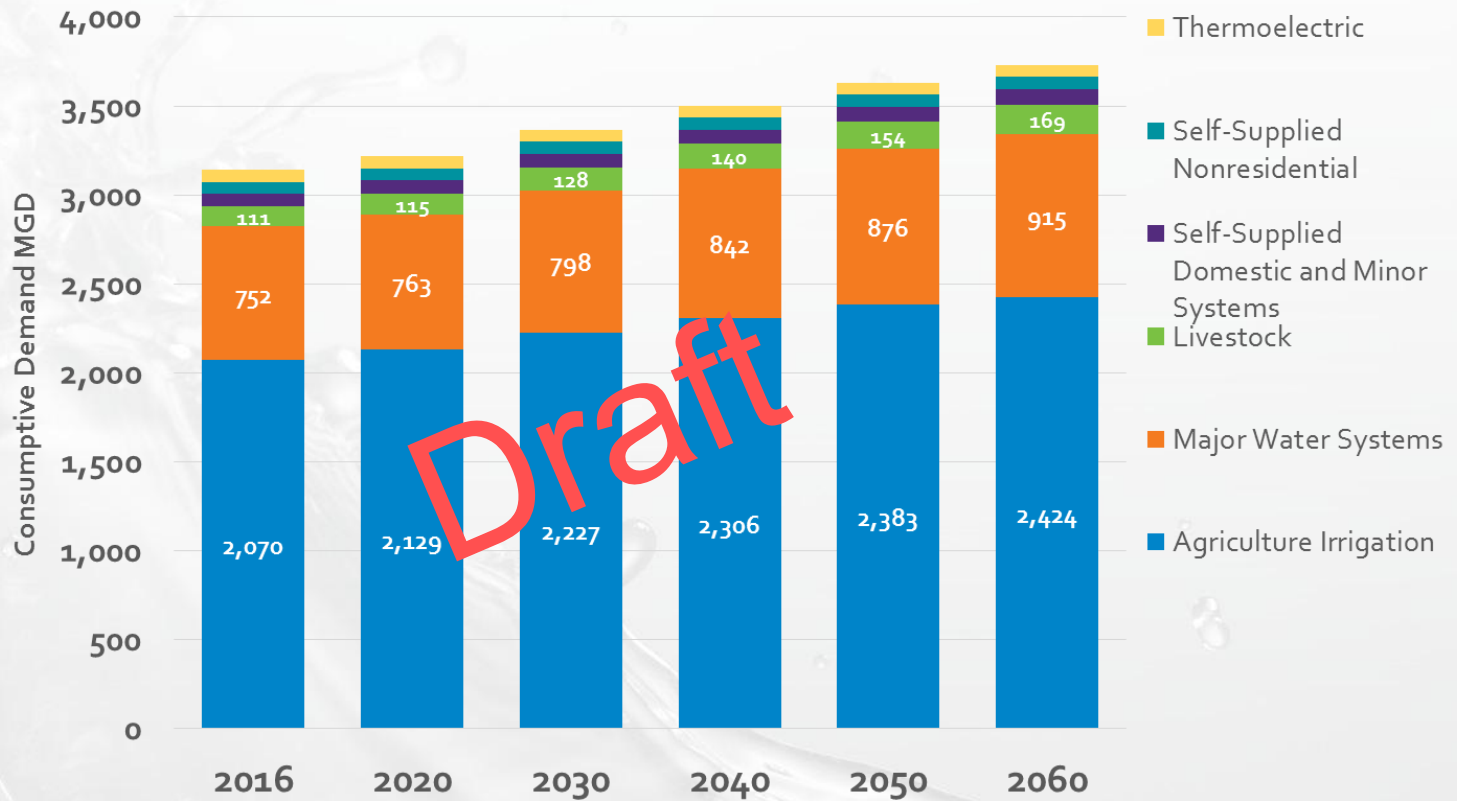
- Evaluate historical monthly water use of livestock and irrigated crops by county in the State of Missouri
- Project the monthly volume of water needed for irrigation and livestock for each county to 2060

Crops Included in Assessment

- Grain Corn
- Soybean
- Cotton
- Rice
- Silage Corn
- Hay
- Sorghum
- Wheat
- “Vegetables”
- “Orchards”
- Sod
- Grass Seed

Draft Demands & Projections

- Demands
- Supply
- Infrastructure
- Water Quality
- Public and Stakeholder Involvement



Water Plan Core Elements: Supply

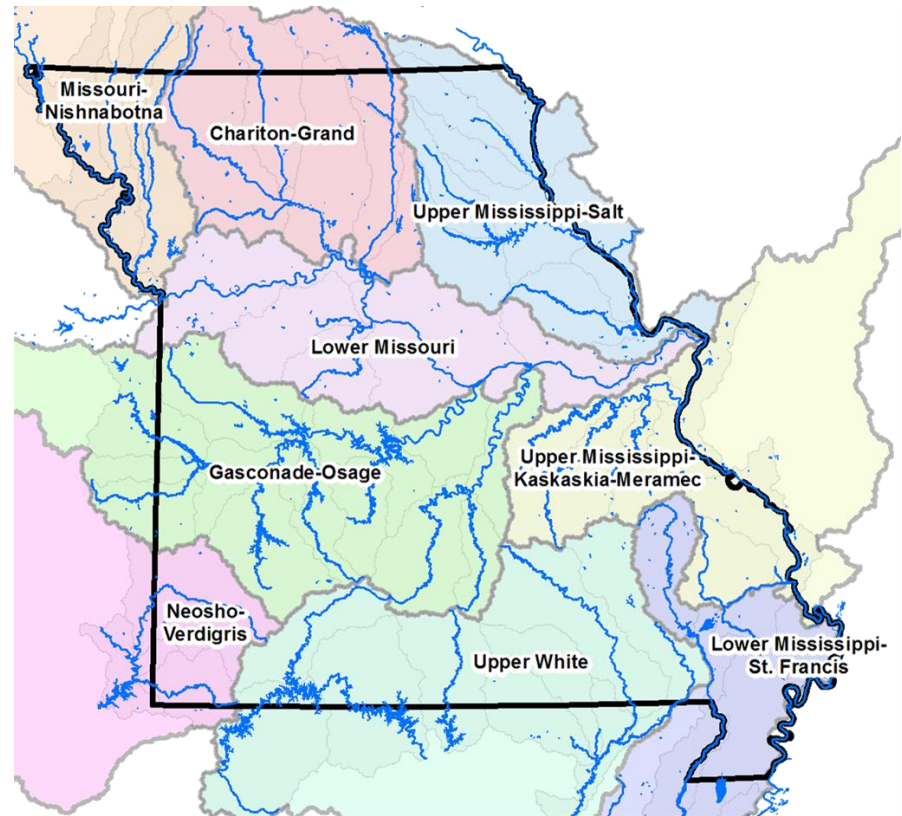
Demands

Supply

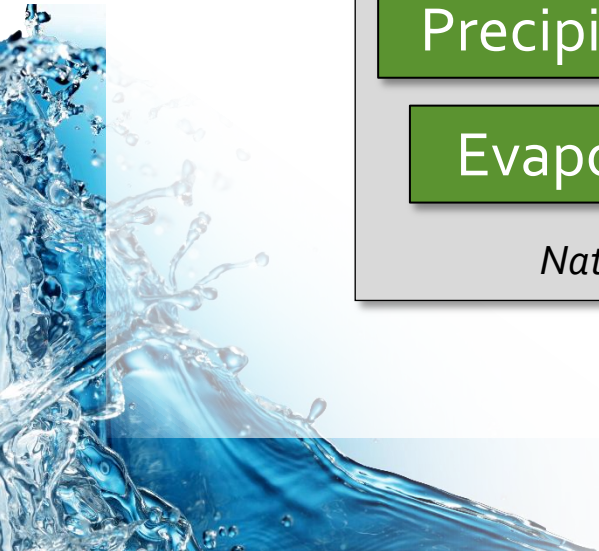
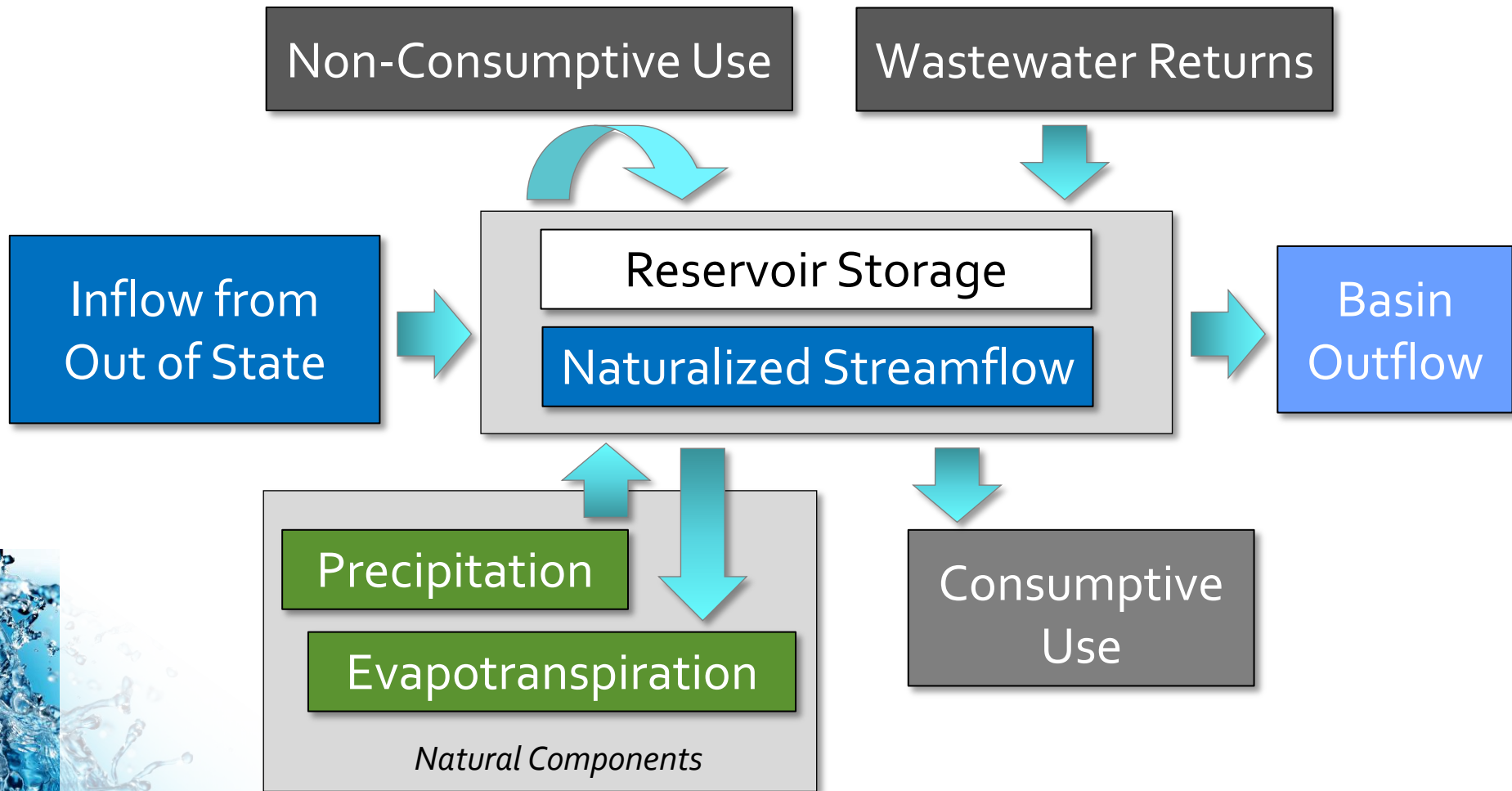
Infrastructure

Water Quality

Public and Stakeholder
Involvement



Surface Water Budget



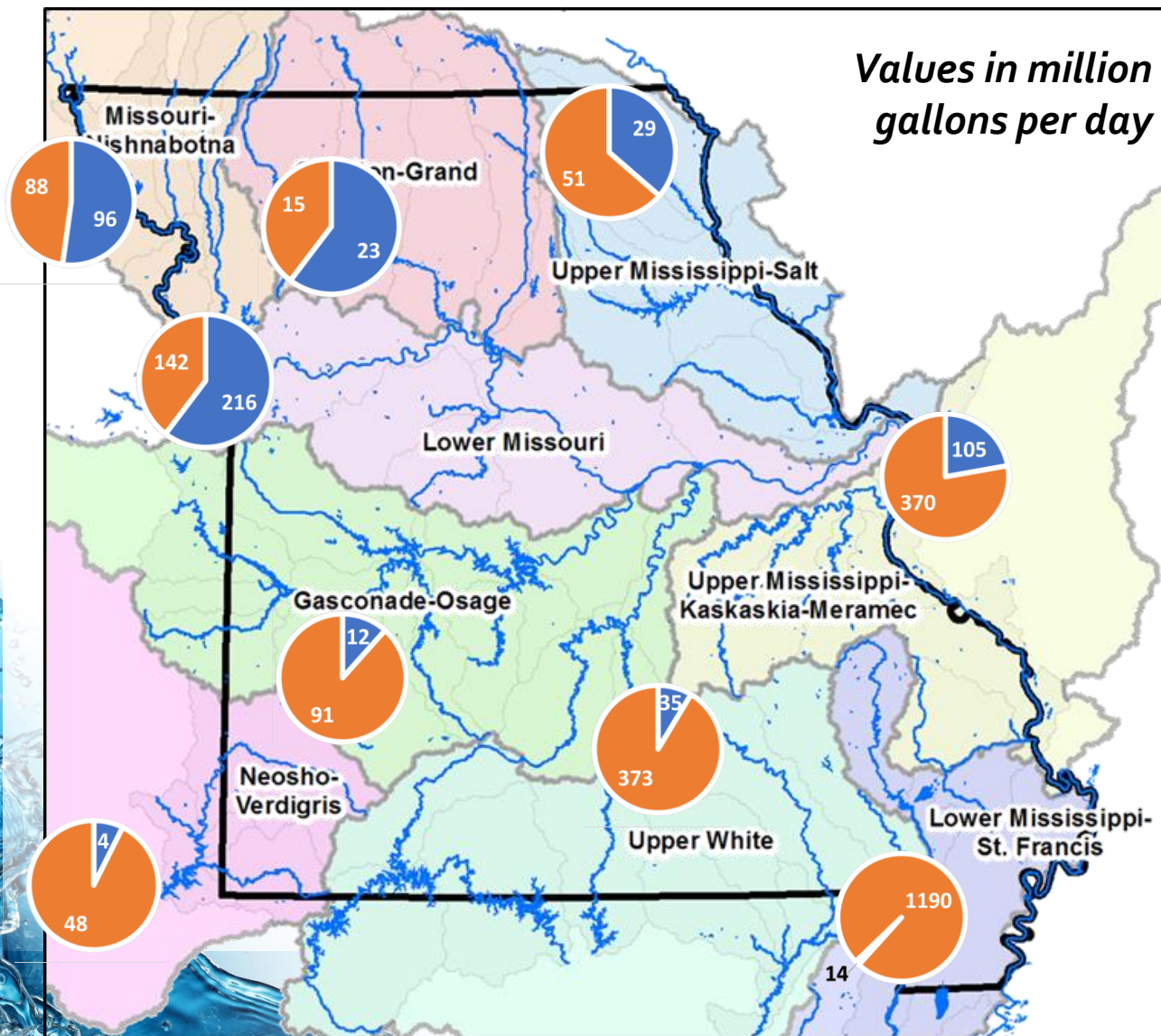
How is Naturalized Streamflow Quantified?

- Representative USGS streamflow gages are selected
- Monthly flow records are unimpaired
- Composite flow developed based on drainage area to each selected gage, then scaled for entire basin
- Streamflow represents available flow at the outlet of each basin

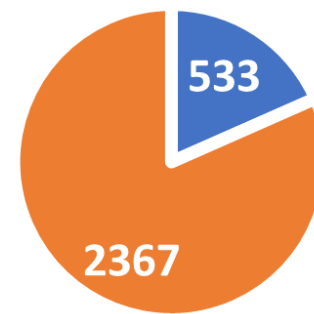


Current Consumptive Water Demands by Source – Draft Results

Values in million gallons per day



State Total



- Groundwater
- Surface Water

Next Steps: Analysis of Surface Water Supply and Demand by HUC8 Basin

- Supply for each HUC4 applied to HUC8 basins
 - Additional analysis necessary to differentiate supply in HUC8 basins
- Useful for identifying where both current and future demands are highest and prioritizing HUC8 basins for further assessment
- To help identify gaps/stress, can also compare:
 - Current and future average annual demands to available streamflow
 - Current and future peak monthly demands to available streamflow
 - Current and future demands to dry year streamflow



Water Plan Core Elements: Infrastructure

Demands

Supply

Infrastructure

Water Quality

Public and Stakeholder
Involvement

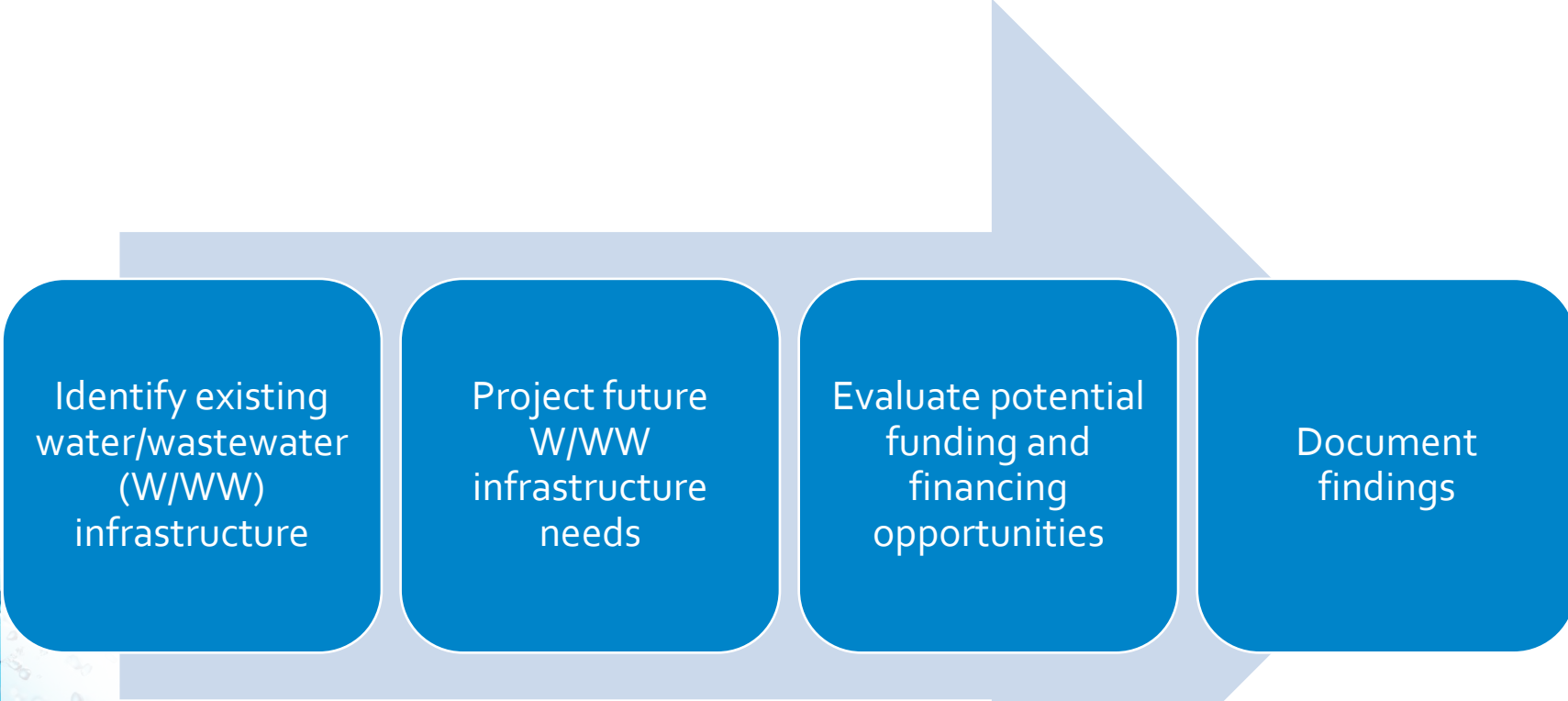
- Infrastructure Analysis
 - EPA 2011 Drinking Water Infrastructure Needs Survey and Assessment (DWINSA)
 - Drinking Water State Revolving Funds (SRF)
 - EPA 2012 Clean Watersheds Needs Survey (CWNS)
 - Missouri Clean Water Information System Database (CWIS)
- Regional Water Supply Studies

Infrastructure Needs

Wastewater and drinking water infrastructure needs in Missouri, over the next twenty years, are estimated to exceed \$9.5 billion and \$8.4 billion, respectively.

(2017 MoDNR, Financial Assistance Center)

Infrastructure Methodology Overview



Identify existing
water/wastewater
(W/WW)
infrastructure

Project future
W/WW
infrastructure
needs

Evaluate potential
funding and
financing
opportunities

Document
findings

Water Plan Core Elements: Water Quality

Demands

Supply

Infrastructure

Water Quality

Public and Stakeholder
Involvement



Water Quality Approach

Goals

- Recognize water quality and assess how this affects water supply uses

Elements

- Analyze statewide water quality and the impact on consumptive water supplies
- Evaluate water quality for assessment of wastewater improvements

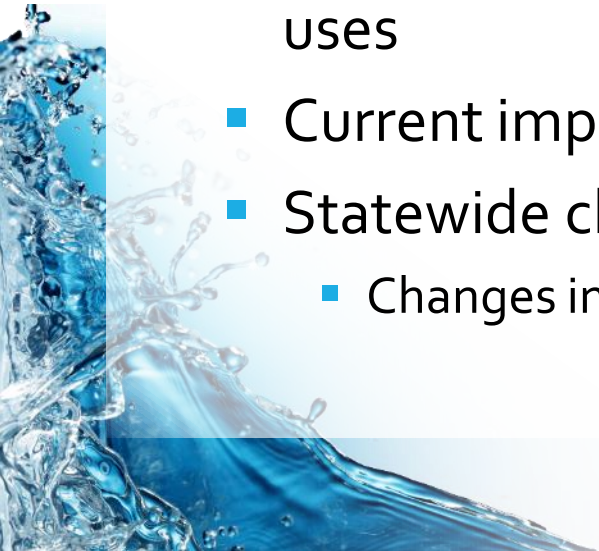
Considerations

- Not intended as a regulatory plan
- Water quality regulations are authorized under different regulatory statutes than those that authorize the development of the statewide water resources plan

Surface Water Quality

General Statewide Discussion

- Primary parameters of concern
- Summary of water quality monitoring in Missouri
 - Monitoring agencies, locations
 - Local studies and additional data sources
 - Volunteer monitoring programs
- Overview of surface waters designated for water supply uses
- Current impairments based on 303(d) list
- Statewide changes in 303(d) listings over time
 - Changes in regulatory focus



Primary Parameters of Concern

Parameter	Primary Sectors Impacted		
	Supply	Wastewater	Recreation and Aesthetics
Ammonia		X	
Bacteria (<i>E. coli</i>)	X	X	X
Chloride	X	X	
Low dissolved oxygen (DO)		X	
Metals (cadmium, copper, lead, manganese, nickel, zinc)	X	X	
Nitrates (primarily groundwater)	X		
Nutrients (nitrogen, phosphorus)	X	X	X
Total organic carbon (TOC)	X		
Pesticides (atrazine, others)	X		
Radiologicals (gross alpha)	X		
Sulfates		X	
Total suspended solids (TSS)	X	X	X

Water Plan Core Elements: Engagement

Demands

Supply

Infrastructure

Water Quality

Public and Stakeholder
Involvement

- Interagency Taskforce
- Technical Workgroups
- Water Resource Plan Presentations
- Missouri Water Resource Plan Brochure
- Water Resources Plan Website



Missouri Water Resources Plan – Website


<http://dnr.mo.gov/mowaterplan/>

MISSOURI DEPARTMENT OF NATURAL RESOURCES

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Missouri Water Resources Plan



Missouri's thousands of miles of rivers, streams and lakes, along with underground aquifers, supply our state's 6 million residents with water to drink and provide a crucial role in supporting outdoor recreation, industry and meeting our agricultural needs.

Get Updates on this Issue

The Missouri Department of Natural Resources determined through previous water planning that water demands in certain areas of the state cannot be met long term, especially under drought conditions.

The Missouri Water Resources Plan will help to identify future shortfalls in water supplies, and explore options to address those water needs. This may include project recommendations such as new infrastructure development, regionalization of water use, integrating water supplies and pursuing financial assistance opportunities.

The department is directed by Missouri statutory law, **Section 640.415, RSMo**, to "... develop, maintain and periodically update a state water plan for a long-range, comprehensive statewide program for the use of surface water and groundwater resources of the state, including existing and future need for drinking water supplies, agriculture, industry, recreation, environmental protection and related needs ..." As such, the department has begun the process of updating the state water plan and anticipates completion of the plan by Fall 2019.

- Water Resources Plan Goals & Objectives
- Interagency Task Force
- Water Plan Technical Workgroups
- 2003 State Water Resources Plan


Contact Information

Water Resources Plan Information
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Jefferson City, MO 65102
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573-751-2867

Email: [Contact Us](#)

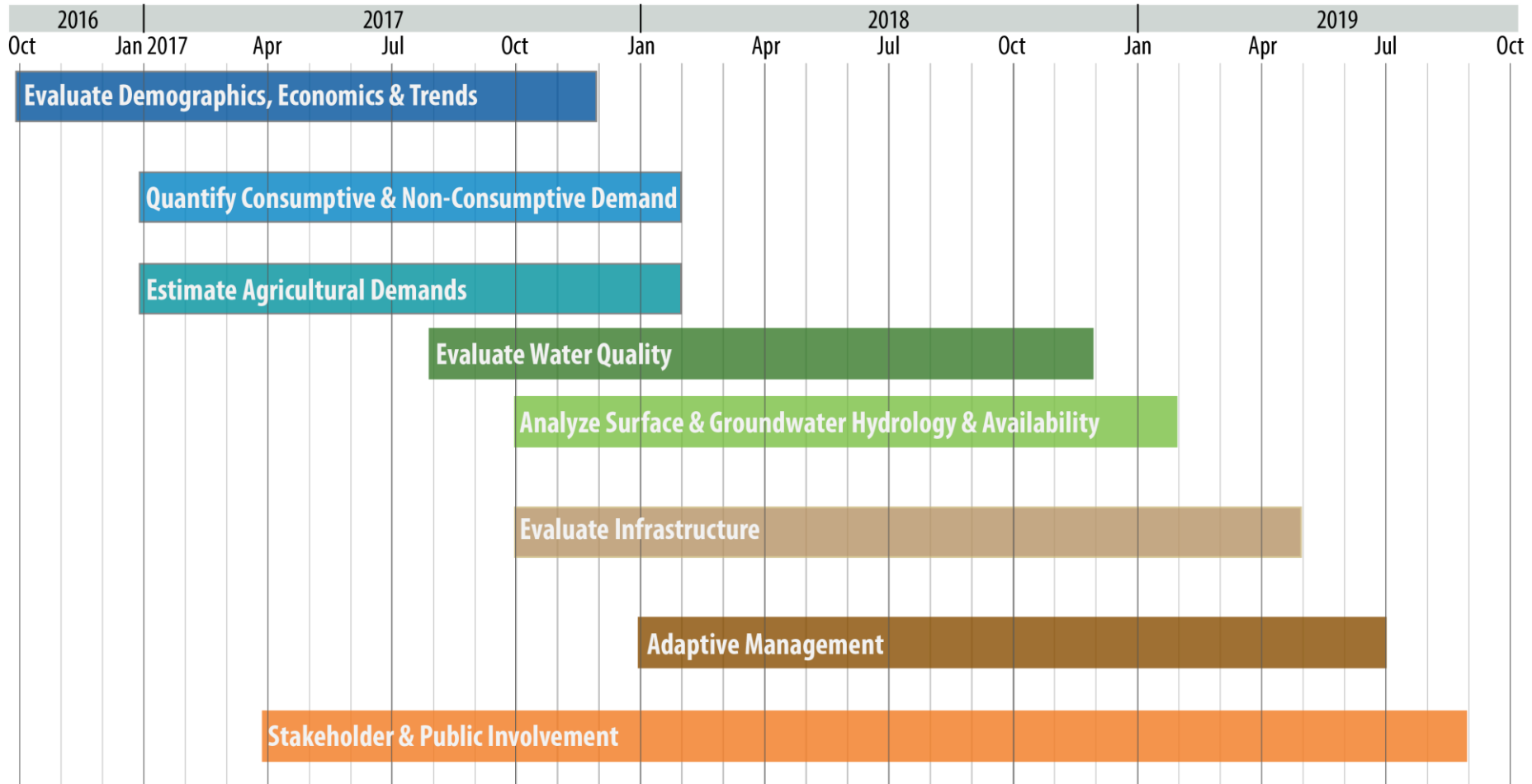
Water Resources Plan Brochure
[11 x 17](#) | [8.5 x 11](#)

[Report an Environmental Concern](#)



dnr.mo.gov/mowaterplan/

Missouri Water Resources Plan Schedule



Technical Workgroups Future Meetings

Technical Workgroups Meet Quarterly

- Met last, August 28, in Jefferson City
- Will meet again in November, 2018

Interagency Task Force Future Meetings

The IATF Meets Twice a Year

- Met last on May 31, 2018
- Will meet again in November 2018

Thank You

