

ADEQ Approaches to the Assessment Methodology

NPS Annual Stakeholder Meeting
September 27, 2017

Overview

- Process of assessing Waters of the State
- State of the Waters
- Public Participation opportunities

Clean Water Act Requirements

Defines Water Quality goals
40 CFR 130.3 and 131



Adopt Water Quality Standards

Data collection based on need
40 CFR 130.4



Monitor Waters of the State

Determines attainment
40 CFR 130.8



Assessment

Identifies Quality Limited Waters
40 CFR 130.7(b)(1)



List Impaired Waters
303(d) List

Defines Waste Loads
40 CFR 130.7



Develop TMDLs

Implementation
40 CFR Part 122



Develop Permit Limits

305(b) Integrated Report



Designated Uses



Primary Contact Recreation



Domestic
Water Supply



Industrial Water Supply



Aquatic Life

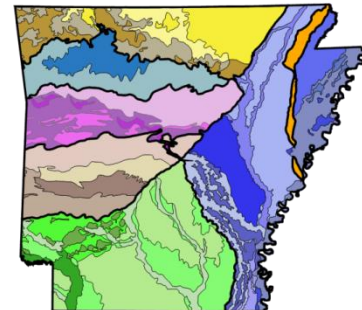


Secondary Contact
Recreation

Water Quality Criteria

Ecoregion Based

Ecoregions	Temp (°C)	Turbidity	
		Base	All
Ozark Highlands	29	10	17
Boston Mountains	31	10	19
Arkansas River Valley	31	21	40
Ouachita Mountains	30	10	18
Gulf Coastal Plain			
Typical	30	21	32
Springwater-influenced	30	21	32
Mississippi Alluvial Plain			
Least Altered	30	45	84
Channel Altered	32	75	250



Clean Water Act Requirements

Defines Water Quality goals
40 CFR 130.3 and 131



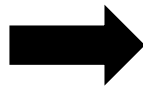
Adopt Water Quality Standards

Data collection based on
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Monitor Waters of the State

Determines attainment
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Assessment

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Develop TMDLs

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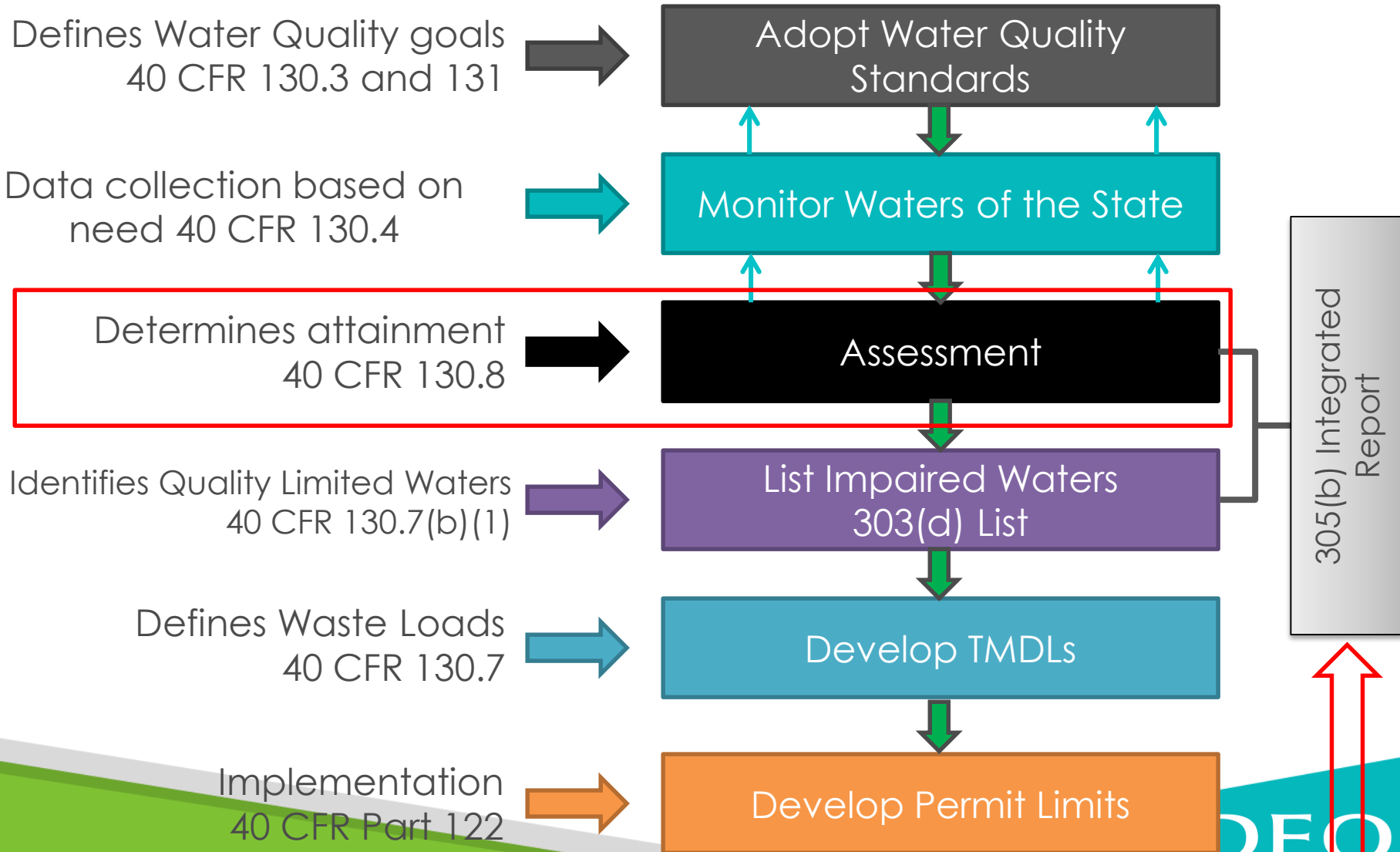


Develop Permit Limits

305(b) Integrated Report



Clean Water Act Requirements



What is the Assessment Methodology?

- Every two years ADEQ must assess the waters of the State to determine if they are:
 - supporting designated uses
 - attaining water quality criteria
- The Assessment Methodology contains procedures for this assessment



Photo: Jack Bissell

What is the Assessment Methodology?

- Prepared by ADEQ staff
- Must be consistent with Reg. 2
- Must be scientifically based
- Assessment outcomes determine:
 - Attainment
 - Non-Attainment

Water Quality Assessment

Water Quality Standard

Ecoregions	Temp (°C)
Ozark Highlands	29
Boston Mountains	31
Arkansas River Valley	31
Ouachita Mountains	30
Gulf Coastal Plain	30
Typical	30
Springwater-influenced	30
Mississippi Alluvial Plain	30
Least Altered	30
Channel Altered	32

Assessment Methodology

ASSESSMENT METHODOLOGY FOR TEMPERATURE

LISTING METHODOLOGY:

Stream and river monitoring segments will be listed as non-support when ADEQ determines that more than 10 percent of the total samples (for the period of record) exceed the applicable temperature standard listed in APC&EC Reg. 2.502.

Lakes and reservoirs will be listed as non-support when ADEQ determines that more than 10 percent of the total samples (for the period of record) exceed the temperature standard of 32°C (89.6°F). Samples collected approximately one meter below the surface of the water will be used to make lake and reservoir attainment decisions.

DELISTING METHODOLOGY:

Stream and river monitoring segments will be listed as support when ADEQ determines that 10 percent or less of the total samples (for the period of record) exceed the applicable temperature standard listed in APC&EC Reg. 2.502.

Lakes and reservoirs will be listed as support when ADEQ determines that 10 percent or less of the total samples for the period of record (collected approximately 1 meter below the surface of the water) exceed the temperature standard of 32°C (89.6°F).




 Water Quality Standard Attainment Decision

Phase I and II Data Quality Requirements

- QA/QC equivalent to ADEQ or USGS
- Analysis must be from State certified lab
- Reported in standard units
- Characteristic of the main water body
- Collected within the period of record
- Phase II requirements are specific to each parameter

Assessment Example

ANRC Data for West Fork Point Remove Creek

Turbidity (NTU)																		
2011	7.2	6.2	5.1	32	29	91	14	17	19	31	17	12	10	9.1				
2012	10	8.0	10	8.2	16	18	7.4	7.7	7.2	32	20	16	13	9.2	9.8	11	10	7.8
	4.6	4.3	44	5.8	16	4.1	4.4	5.1	5.5	4.1	11	12	17	5.9	11	15	39	32
	164		34	20	130		28	14	8.4	50	23	12	5.5	24				
2013	4.9	83	55	27	19	11	8.0	21	11	10	7.2	5.7	5.0	4.6	16	7.7	7.5	10
	6.9	8.8	8.5	16	10	5.8	4.1											

AR River Valley Turbidity Standard

Base Flows (21 NTU)*
All Flows (40 NTU)

Impairments

11/32 (34.4%)
7/89 (7.8%)

The 2014 Assessment Methodology allows a 20% exceedance of the total base flow values and a 25% exceedance of the total all flow values.

*Base flow occurs between June 1 and October 31; all flows represent the entire calendar year.

Assessment Example

ANRC & ADEQ Data for West Fork Point Remove Creek River

		Turbidity (NTU)																							
ANRC	2011	7.2	6.2	5.1	32.6	29.4	90.6																		
	2012	44.0	5.8	15.7	4.1	4.4	5.1	5.5	4.1	10.7	12.2	17.4	5.9	10.5	15.3	38.7	143.0	38.3	32.3	24.3	164.0	33.6	19.6		
	2013	15.9	10.3	5.8	4.1																				
ADEQ	2012	8.10	7.95	14.8	10.0																				

AR River Valley Turbidity Standard: Base Flows (21 NTU)*

The 2014 Assessment Methodology allows a 20% exceedance of the total base flow values and a 25% exceedance of the total all flow values.

*Base flow occurs between June 1 and October 31; all flows represent the entire calendar year.

Data Sources

ANRC

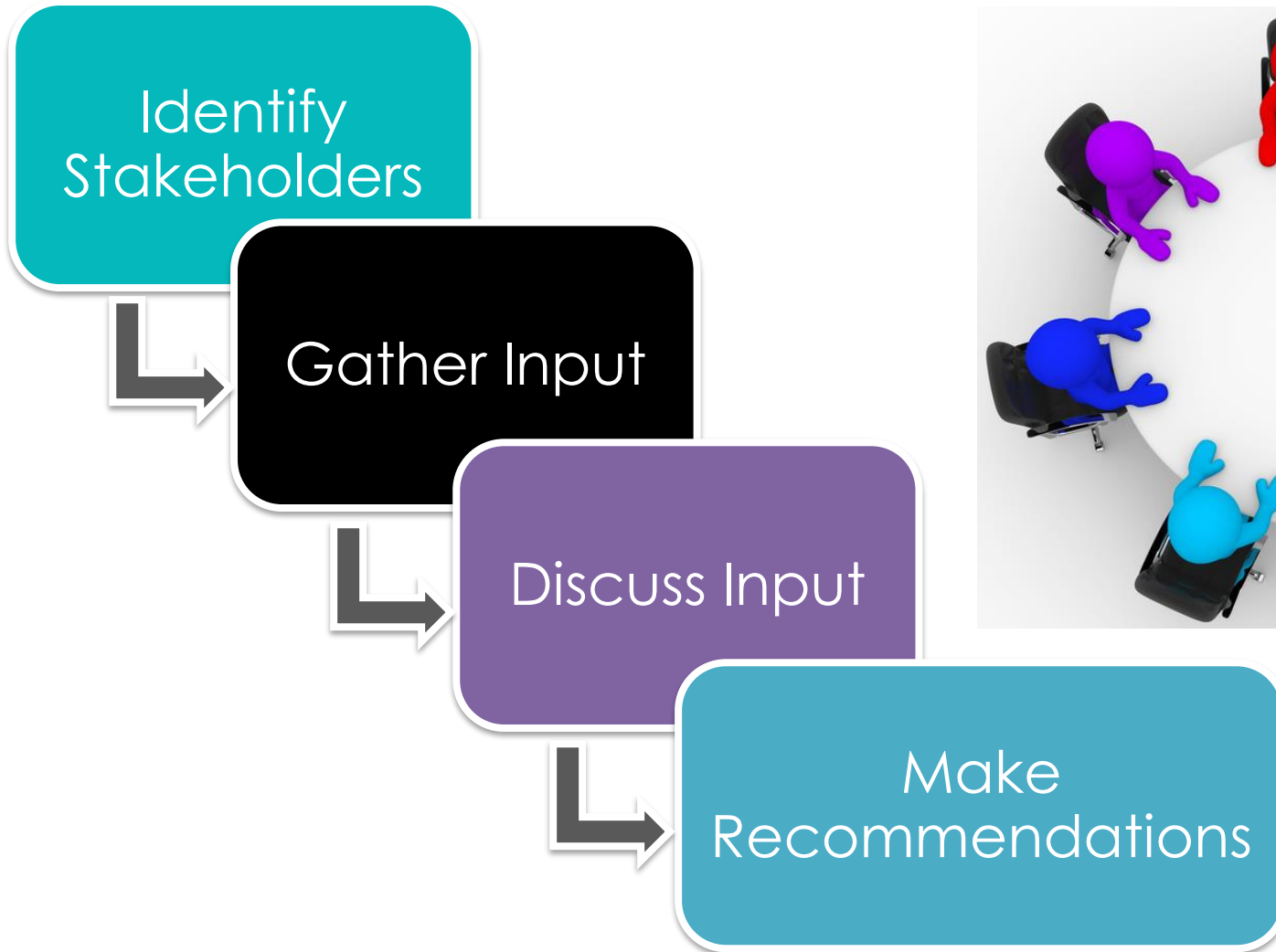
ANRC & ADEQ

Impairments

11/32 (34.38%)

11/36 (30.56%)

The Stakeholder Process



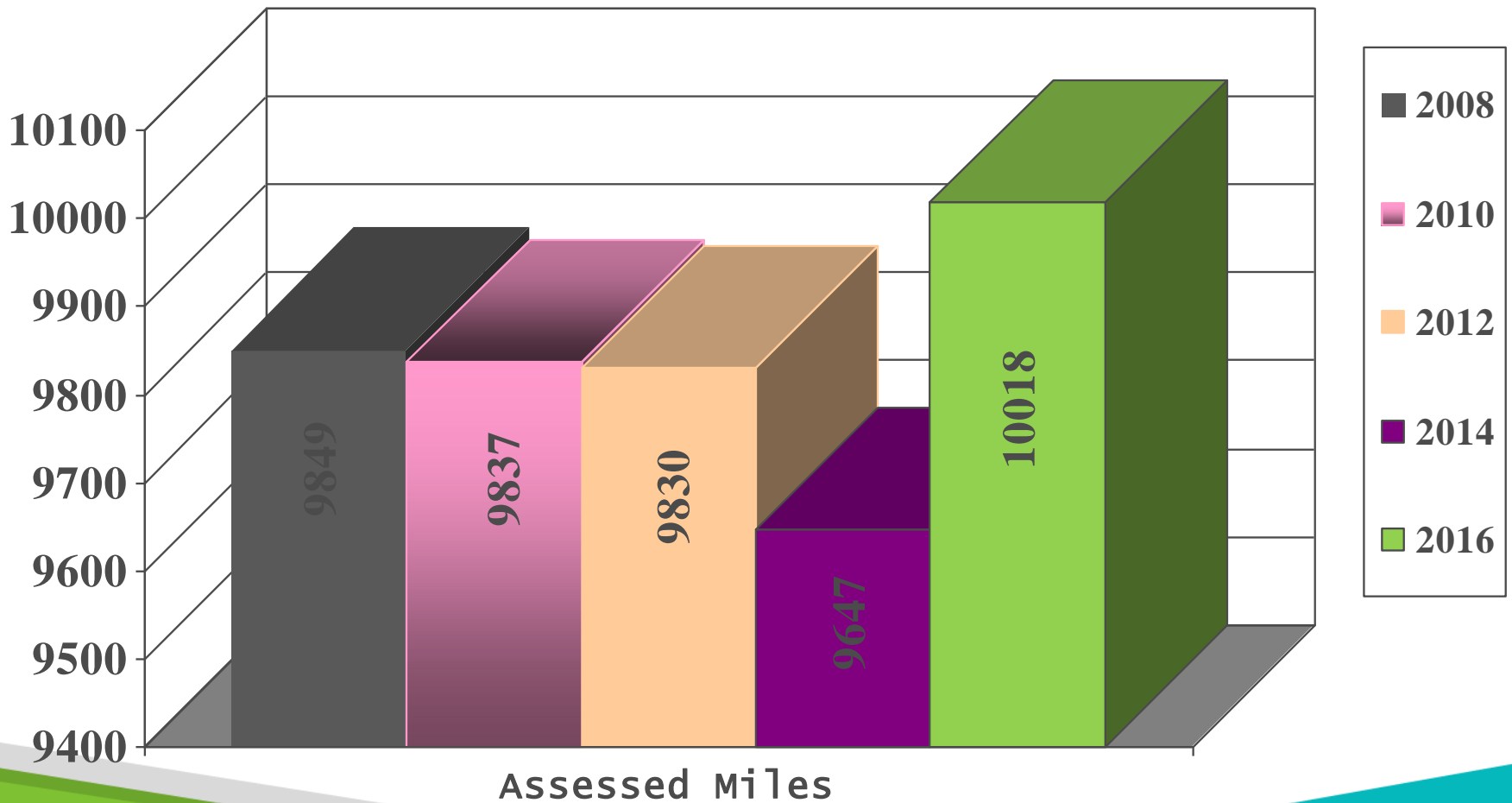
Revisions in current AM Draft

- Methodology for continuous DO, pH and temperature measurement
- Use of binomial method to reduce the probability of error in decision making
- Clarification of data quality expectations and others

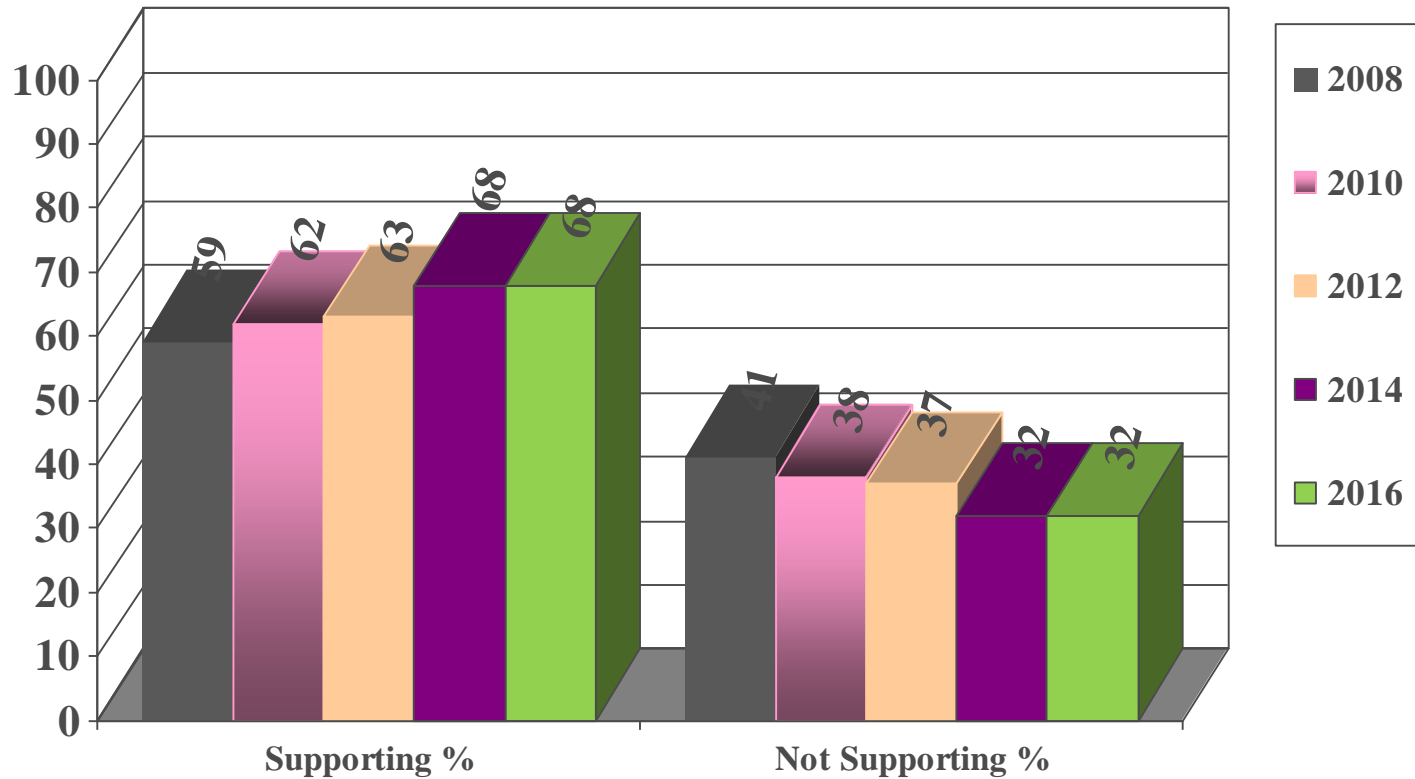
Timeline for Revision

- Public Listening Session Oct 11, 2016
- Input Period Closes Oct 31, 2016
- Provide Summary of Input Nov 2016
- Stakeholder Workgroup Dec-July 2017
- Provide Summary of Input July 2017
- Public Notice 2017
- Response to Comments 2017
- Finalize Methodology 2017

2016 Miles Assessed



2016 Designated Use Support & Water Quality Standards Attainment



New Listings for 2016

72 Pollutant Pairs

- Minerals - Cl, SO₄, TDS (19)
- Turbidity (3)
- Dissolved Oxygen (26)
- Metals - Cu, Pb, Zn, Se (13)
- Temperature (3)
- Pathogens (1)
- pH (7)

De-Listings for 2016

98 Pollutant Pairs

- Minerals - Cl, SO₄, TDS (31)
- Metals - Cu, Pb, Zn (27)
- Turbidity (20)
- pH (8)
- Dissolved Oxygen (4)
- Temperature (8)
- Pathogens (0)

Deferred Action-Streams

- Bayou Bartholomew
- Bayou DesArc
- Bayou Deview
- Cache River
- Cossatot River
- Cypress Creek
- Huckleberry Creek
- Hurricane Creek
- S. Fork Little Red
- Maumelle River
- Ouachita River
- White River
- White Oak Bayou
- W. Pt. Remove
- W. Fork White
- Unnamed Tribs.
- Spring River
- S. Fork Spring
- Saline River
- Red River
- North & Middle Saline
- Yount Creek

Deferred Action - Lakes

- Dierks Lake
- Gilham Lake
- Lake Austelle
- Lake Catherine
- Poinsett Lake
- Lake Cox Creek
- Lake DeQueen
- Lake Ouachita

Public Participation Opportunities

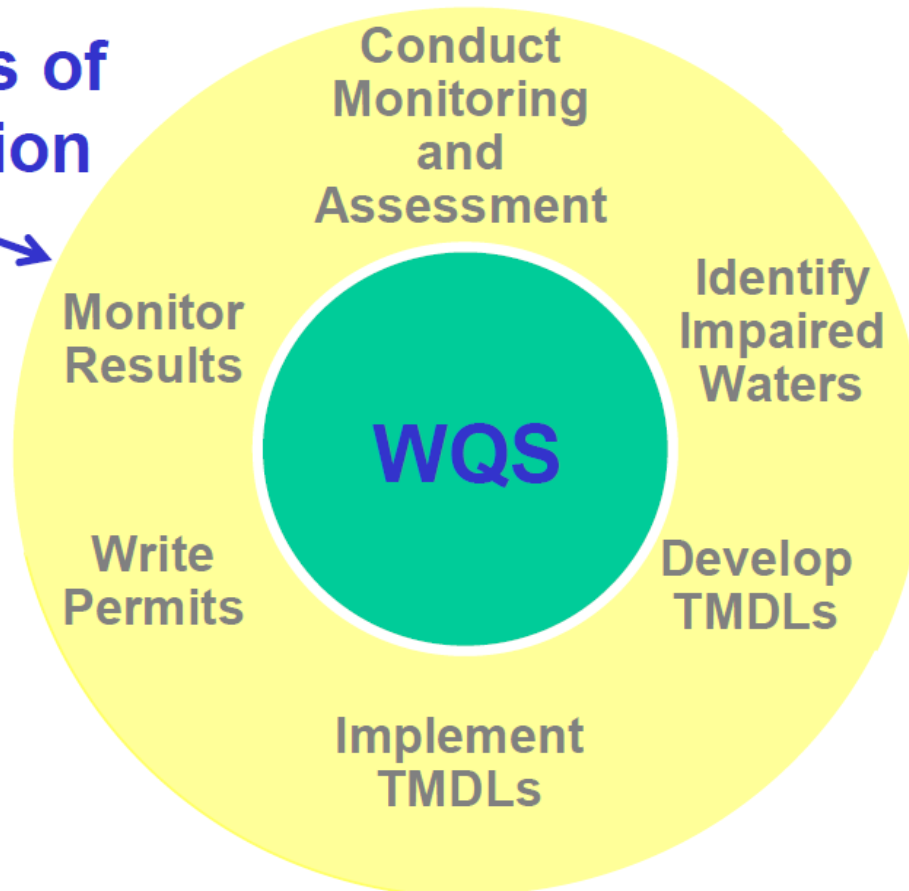
- 2018 Assessment Methodology
 - Comment on Final Draft
- Regulation No. 2 Triennial Review
 - Stakeholder Group to begin in 2017
- Continuous Planning Process
 - Stakeholder Group to begin in 2018

Water Quality Criteria

- ADEQ solicits water quality data from state and federal agencies, universities, and other entities.
 - Data must meet or exceed ADEQ's or USGS' QA/QC protocols.
- ADEQ assembles and evaluates all existing and readily available data.
 - Data that does not meet QA/QC protocols will not be used to determine water quality standards attainment; however, these data may be used as a screening tool to determine whether additional monitoring is warranted.
- Data sets containing <10 data points will be used as a screening sample.
 - Segments with <10 data points and 2 or more exceedances will warrant additional monitoring and may be placed in Category 3 for further investigation.
- Samples sizes of 10 data points or greater will be used to make water quality standard attainment decisions; appropriate exceedance rates apply.

Water Quality Based Approach

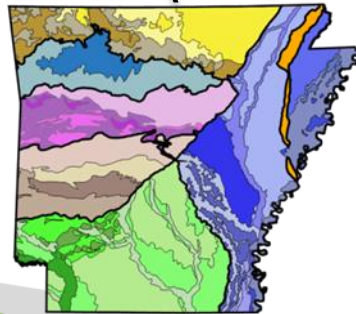
Many aspects of implementation



Water Quality Standards

Ecoregion Based

- In Arkansas, water quality standards were developed using data from least-disturbed streams within each of the State's six (6) ecoregions
- The data used for standards development were collected during an intensive, statewide study of the physical, chemical, and biological characteristics of least-disturbed streams (1983-1986)



Water Quality Standards

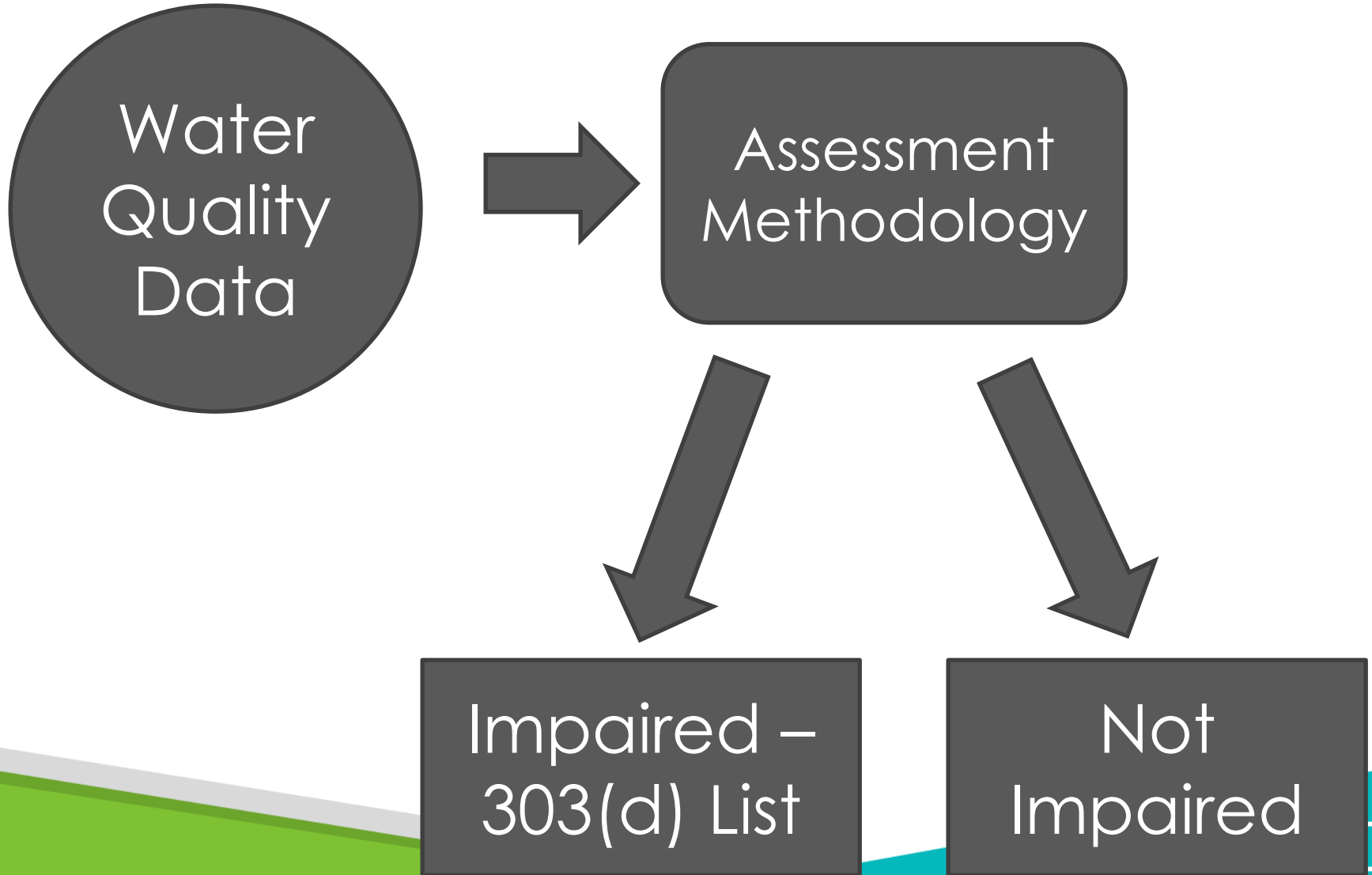
Biological and water quality standards include criteria designed to prevent impairment of water quality data collected throughout the state are utilized to create water quality standards for the state's surface waters.

– the designated uses.

These criteria serve as the regulatory basis for water quality-based treatment controls under Section 303(e) of the Clean Water Act



Assessment Process



Water Quality Criteria

Assessment Methodology

Assessment Criteria	Exceedance Rates	
Temperature (°C)	>10%	
Turbidity	Base Flows >20%*	All Flows >25%
pH	not below 6.0 or above 9.0 s.u.	
Dissolved Oxygen	>10%	
Toxic Substances	>1 exceedance of the criterion	

*Base flow values represent the critical season, June 1 to October 31.