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
- Data collection based on need 40 CFR 130.4
- Determines attainment 40 CFR 130.8
- Identifies Quality Limited Waters 40 CFR 130.7(b)(1)
- Defines Waste Loads 40 CFR 130.7
- Implementation 40 CFR Part 122

Adopt Water Quality Standards

Monitor Waters of the State

Assessment

List Impaired Waters 303(d) List

Develop TMDLs

Develop Permit Limits

305(b) Integrated Report
Designated Uses

- Primary Contact Recreation
- Aquatic Life
- Domestic Water Supply
- Industrial Water Supply
- Secondary Contact Recreation
## Water Quality Criteria
### Ecoregion Based

<table>
<thead>
<tr>
<th>Ecoregions</th>
<th>Temp (°C)</th>
<th>Turbidity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Base</td>
</tr>
<tr>
<td>Ozark Highlands</td>
<td>29</td>
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</tr>
<tr>
<td>Boston Mountains</td>
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<td>10</td>
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<tr>
<td>Arkansas River Valley</td>
<td>31</td>
<td>21</td>
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<tr>
<td>Ouachita Mountains</td>
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<td>10</td>
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<tr>
<td>Gulf Coastal Plain</td>
<td></td>
<td></td>
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<tr>
<td>Typical Springwater-influenced</td>
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<tr>
<td>Mississippi Alluvial Plain</td>
<td></td>
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</table>
Clean Water Act Requirements

Defines Water Quality goals
40 CFR 130.3 and 131

Adopt Water Quality Standards

Monitor Waters of the State

Assessment

List Impaired Waters
303(d) List

Develop TMDLs

Develop Permit Limits

Implementation
40 CFR Part 122

Determines attainment
40 CFR 130.8

Data collection based on need
40 CFR 130.4

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

Defines Waste Loads
40 CFR 130.7

305(b) Integrated Report
Clean Water Act Requirements

- Defines Water Quality goals
  - 40 CFR 130.3 and 131

- Data collection based on need
  - 40 CFR 130.4

- Determines attainment
  - 40 CFR 130.8

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

- Defines Waste Loads
  - 40 CFR 130.7

- Implementation
  - 40 CFR Part 122

- Adopt Water Quality Standards

- Monitor Waters of the State

- Assessment

- List Impaired Waters
  - 303(d) List

- Develop TMDLs

- Develop Permit Limits

305(b) Integrated Report
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
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

<table>
<thead>
<tr>
<th>Ecoregions</th>
<th>Temp (°C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ozark Highlands</td>
<td>29</td>
</tr>
<tr>
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<tr>
<td></td>
<td>Springwater-influenced</td>
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<td>30</td>
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<td>Least Altered</td>
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<tr>
<td></td>
<td>Channel Altered</td>
</tr>
<tr>
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<td>32</td>
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</table>

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**

<table>
<thead>
<tr>
<th>Turbidity (NTU)</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
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<td>10</td>
<td>4.9</td>
</tr>
<tr>
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<td>8.0</td>
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<td>5.1</td>
<td>10</td>
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<td>32</td>
<td>8.2</td>
<td>27</td>
</tr>
<tr>
<td></td>
<td>29</td>
<td>16</td>
<td>19</td>
</tr>
<tr>
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<td>11</td>
</tr>
<tr>
<td></td>
<td>14</td>
<td>7.4</td>
<td>8.0</td>
</tr>
<tr>
<td></td>
<td>17</td>
<td>7.7</td>
<td>21</td>
</tr>
<tr>
<td></td>
<td>19</td>
<td>7.2</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>31</td>
<td>32</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>17</td>
<td>20</td>
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<td>8.8</td>
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<td></td>
<td></td>
<td>11</td>
<td>8.5</td>
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<tr>
<td></td>
<td></td>
<td>10</td>
<td>8.5</td>
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<td></td>
<td>9.1</td>
<td>5.8</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4.1</td>
</tr>
</tbody>
</table>

**AR River Valley Turbidity Standard**

- Base Flows (21 NTU)*
  - 11/32 (34.4%)
- All Flows (40 NTU)
  - 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

Table IV-3: Water Quality Limited Waterbodies - Streams and Rivers (Category 5) – 303(d) List

<table>
<thead>
<tr>
<th>Stream Name</th>
<th>County</th>
<th>HUC</th>
<th>RCH</th>
<th>Plan Seq</th>
<th>Miles</th>
<th>Monitoring Station</th>
<th>Designated Use Not Supported</th>
<th>Water Quality Standard Not-Attainment</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arkansas River</td>
<td>Jefferson</td>
<td>11110207</td>
<td>-001</td>
<td>3C</td>
<td>6.7</td>
<td>ARK0049</td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Fourche Creek</td>
<td>Pulaski</td>
<td>11110207</td>
<td>-024</td>
<td>3C</td>
<td>11.2</td>
<td>ARK0130+</td>
<td>x</td>
<td>x</td>
<td>L</td>
</tr>
<tr>
<td>Fourche Creek</td>
<td>Pulaski</td>
<td>11110207</td>
<td>-022</td>
<td>3C</td>
<td>9.2</td>
<td>ARK0131+</td>
<td>x</td>
<td>x x x</td>
<td></td>
</tr>
<tr>
<td>Cypress Creek</td>
<td>Conway</td>
<td>11110205</td>
<td>-917</td>
<td>3D</td>
<td>11.2</td>
<td>ARK0132</td>
<td>x</td>
<td>x x x</td>
<td>L</td>
</tr>
<tr>
<td>E. Fork Cadron Creek</td>
<td>Faulkner</td>
<td>11110205</td>
<td>-002</td>
<td>3D</td>
<td>15.6</td>
<td>ARK0156+</td>
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<td>x</td>
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<tr>
<td>N. Fork Cadron Creek</td>
<td>VanBuren</td>
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<td>-015</td>
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<td>28.5</td>
<td>UWNCC02</td>
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<td>x</td>
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<tr>
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<td>Perry</td>
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<td>-001</td>
<td>3E</td>
<td>25.7</td>
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<td>L</td>
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<tr>
<td>S. Fourche R</td>
<td>Perry, Yell</td>
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<td>-014</td>
<td>3E</td>
<td>28.1</td>
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<tr>
<td>Fourche LaFave R</td>
<td>Scott</td>
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<td>-008</td>
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<td>25.7</td>
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<td>Fourche LaFave R</td>
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<td>-007</td>
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<td>20.2</td>
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<tr>
<td>W.Fk Point Remove</td>
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<td>-017</td>
<td>3F</td>
<td>14.4</td>
<td>ANRC</td>
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<td>E. Fk Point Remove</td>
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<td>-014</td>
<td>3F</td>
<td>20.9</td>
<td>ANRC</td>
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<td>x</td>
<td></td>
</tr>
<tr>
<td>Stone Dam Creek</td>
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<td>Pett Jean River</td>
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<td>H</td>
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<td>3G</td>
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<td>ARK0057</td>
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<td>UN H</td>
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</tbody>
</table>
# Assessment Example

## ANRC & ADEQ Data for West Fork Point Remove Creek River

<table>
<thead>
<tr>
<th>Turbidity (NTU)</th>
<th>ANRC</th>
<th>ADEQ</th>
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<tbody>
<tr>
<td>2011</td>
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</tr>
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</tr>
<tr>
<td>2013</td>
<td>15.9</td>
<td>10.3</td>
</tr>
</tbody>
</table>

**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%)
# Assessment Example

**ANRC & ADEQ Data for West Fork Point Remove Creek**

## Table IV-3: Water Quality Limited Waterbodies - Streams and Rivers (Category 5) – 303(d) List

<table>
<thead>
<tr>
<th>Stream Name</th>
<th>County</th>
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<th>RCH</th>
<th>Plan Seg</th>
<th>Miles</th>
<th>Monitoring Station</th>
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<th>Water Quality Standard Non-Attainment</th>
<th>Source</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arkansas River</td>
<td>Jefferson</td>
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<td>-001</td>
<td>3C</td>
<td>6.7</td>
<td>ARK0048</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fourche Creek</td>
<td>Pulaski</td>
<td>11110207</td>
<td>-024</td>
<td>3C</td>
<td>11.2</td>
<td>ARK0130+</td>
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<td>x x x x x x x x x x x x x x x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fourche Creek</td>
<td>Pulaski</td>
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<td>-022</td>
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<td>ARK0131+</td>
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<td>x x x x x x x x x x x x x x x</td>
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<tr>
<td>Cypress Creek</td>
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<td>3D</td>
<td>11.2</td>
<td>ARK0132</td>
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<td>x x x x x x x x x x x x x x x</td>
<td></td>
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</tr>
<tr>
<td>E. Fork Cadron Creek</td>
<td>Faulkner</td>
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</tr>
<tr>
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<td>-015</td>
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<td>-001</td>
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</tr>
<tr>
<td>S. Fourche R.</td>
<td>Perry, Yell</td>
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</tr>
<tr>
<td>W. Fk.Point Remove</td>
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<td>-017</td>
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<tr>
<td>W. Fk. Point Remove</td>
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<td>-016</td>
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<td>Petit Jean River</td>
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<td>3G</td>
<td>21.6</td>
<td>ARK0034</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The highlighted cell indicates the assessment for the West Fork Point Remove Creek.
The Stakeholder Process

- Identify Stakeholders
- Gather Input
- Discuss Input
- Make Recommendations
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
- 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

Assessed Miles

2008
2010
2012
2014
2016

9400
9500
9600
9700
9800
9900
10000
10100
10200

9849
9837
9830
9647
10018

ADEQ
Department of Environmental Quality
2016 Designated Use Support & Water Quality Standards Attainment

![Graph showing the percentage of supporting and not supporting water quality standards from 2008 to 2016. The graph compares the years 2008, 2010, 2012, 2014, and 2016. The categories are Supporting % and Not Supporting %.]
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

- Conduct Monitoring and Assessment
- Identify Impaired Waters
- Develop TMDLs
- Implement TMDLs
- Write Permits
- Monitor Results
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 Data → Assessment Methodology →

Impaired – 303(d) List

Not Impaired

Impaired – 303(d) List
## Water Quality Criteria

### Assessment Methodology

<table>
<thead>
<tr>
<th>Assessment Criteria</th>
<th>Exceedance Rates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature (°C)</td>
<td>&gt;10%</td>
</tr>
<tr>
<td>Turbidity</td>
<td>Base Flows &gt;20%*</td>
</tr>
<tr>
<td></td>
<td>All Flows &gt;25%</td>
</tr>
<tr>
<td>pH</td>
<td>not below 6.0 or above 9.0 s.u.</td>
</tr>
<tr>
<td>Dissolved Oxygen</td>
<td>&gt;10%</td>
</tr>
<tr>
<td>Toxic Substances</td>
<td>&gt;1 exceedance of the criterion</td>
</tr>
</tbody>
</table>

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