Basin Summary Report 2023

Lower Colorado River Authority
Texas Clean Rivers Program
Basin Summary Report

Overview

• **What?**
  – Decision making aid for water quality
  – Prioritize water bodies for action
  – Select watersheds for special studies
  – Identify sections of the basin that have data gaps

• **Why?**
  – Understand water quality conditions, trends, changes, and possible sources of degradation
Analysis Methodology

• **Temporal Trends (changes over time)**
  – Data in SWQMIS collected from 2011 through 2021
  – At least 20 points of data
  – Less than 50% of data is censored (below or above the limit of detection)

• **Spatial Comparison (where are parameters different)**
  – Similar to temporal trends
  – At least 10 points of data

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Parameter List

- Water Temperature
- pH
- Dissolved Oxygen
- Secchi Depth
- Total Suspended Solids
- Chloride
- Sulfate
- Nitrate
- Total Kjeldahl Nitrogen
- Ammonia
- Total Phosphorus
- Chlorophyll $a$
- $E. coli$ (freshwater)
- Enterococci (saltwater)
## General Results

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Increases</th>
<th>Decreases</th>
<th>Concerns</th>
<th>Impairments</th>
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<td>Water Temperature</td>
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<td>pH</td>
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<tr>
<td>Dissolved Oxygen</td>
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<td>29</td>
<td>10</td>
<td>4</td>
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<td>Secchi Depth</td>
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<td>5</td>
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<td>TSS</td>
<td>11</td>
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<tr>
<td>Chloride</td>
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<td>54</td>
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<tr>
<td>Sulfate</td>
<td>9</td>
<td>48</td>
<td>3</td>
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<tr>
<td>Nitrate</td>
<td>20</td>
<td>12</td>
<td>32</td>
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<tr>
<td>TKN</td>
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<tr>
<td>Ammonia</td>
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<tr>
<td>Total Phosphorus</td>
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<td>Chlorophyll a</td>
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<td>Bacteria</td>
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<td>9</td>
<td>13</td>
</tr>
</tbody>
</table>

Assessment Units: 174
Stations: 219
Colorado River Basin
## Impairments and Concerns in each Sub-Basin

<table>
<thead>
<tr>
<th>Sub-Basin</th>
<th>Concerns</th>
<th>Impairments</th>
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<tr>
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<td>Lake Buchanan</td>
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<td>13</td>
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<td>Lake Travis</td>
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<td>Austin</td>
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Lake Buchanan Basin

Data Trends
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<th>Assessment Unit</th>
<th>Station</th>
<th>Concerns</th>
<th>Impairments</th>
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</tbody>
</table>

Lake Buchanan Basin
Nitrate Concerns or Impairments

Concerns
Brady Creek downstream of Brady
Concerns
Brady Creek downstream of Brady

Nitrate

Lake Buchanan Basin

Impairment for standard
Concern for water quality standard
Concern for water quality standard

Impairment for standard

Concerns
CR near Stacy, TX
CR HWY 377
Brady Ck Reservoir
Brady Ck downstream Brady
CR at US 190 (downstream San Saba)

Chlorophyll

Chlorophyll-a (µg/L)
Lake Buchanan
Secchi Depth

StationID: 12344-SURFACE

$R^2 = 0.1$

p-value = 0.0034
Concern for water quality standard

Impairment for standard

San Saba at SH 16

E. coli

Lake Buchanan Basin

Station ID - Sample Location

E. coli (MPN/100mL)

Impairments

Waterbody

- Lake Buchanan
- Cherokee Ck
- Brady Ck
- Colorado River
- San Saba
- Brady Ck Reservoir
Lake LBJ Basin

Data Trends
Concern for water quality standard

Impairment for standard

Impairments Clear Creek

Concern for water quality standard
Concern for water quality standard

Impairment for standard

Impairments
Lake LBJ

Chlorophyll

Waterbody
- Lake LBJ
- Llano River
- Inks Lake
- Clear Ck

Chlorophyll-a (μg/L)
Concern for water quality standard

Impairment for standard

Impairments
Lake Marble Falls

Chlorophyll

Lake Travis Basin

Waterbody
- Lake Travis
- Pedernales River
- Lake Marble Falls
Lake Travis
*(Big Sandy Creek Cove)*

Chlorophyll

StationID: 12307-SURFACE

\[ R^2 = 0.07 \]

\[ p-value = 0.0097 \]
StationID: 12307-SURFACE

$R^2 = 0.33$

$p$-value $< 0.0001$

_Lake Travis_

**Secchi Depth**
Concern for water quality standard

Impairment for standard

Concerns
Cypress Creek

E. coli
Austin Basin

Data Trends
Concern for water quality standard

Impairment for standard

Concerns
Taylor Slough South
Colorado River below FM 973
Gilleland Creek

Nitrate (mg/L)

Waterbody:
- Colorado River
- Walnut Creek
- Barton Creek
- Taylor Slough
- Gilleland Creek
- Lady Bird Lake
- Lake Austin
Concern for water quality standard

Impairment for standard

Impairments
Lady Bird Lake

Chlorophyll-a (μg/L)

Station ID - Sample Location

Austin Basin

12297-SURFACE

12294-SURFACE

12486-SURFACE

14067-SURFACE

12476-SURFACE

12474-SURFACE

12466-SURFACE

Waterbody

Colorado River  Lady Bird Lake  Lake Austin
Concern for water quality standard

Impairment for standard

Impairments
Taylor Slough South Gilleland Creek

E. coli

Waterbody:
- Colorado River
- Walnut Ck
- Barton Ck
- Taylor Slough
- Gilleland Ck
- Lady Bird Lake
- Lake Austin
Station ID: 12474-SURFACE

$R^2 = 0.03$

p-value = 0.0939

**Colorado River @ 183**

**E. coli**
Lower Colorado River Basin

Data Trends
Concern for water quality standard
Impairment for standard

Lower Colorado River Basin

Nitrate

Nitrate (mg/L)

Waterbody
- Colorado River Tidal
- Skull Ck
- Alum Ck
- Colorado River
- Lake Fayette
- Wilbarger Ck
Concern for water quality standard

Impairment for standard

Concerns
Wilbarger Creek
Colorado River below La Grange

Chlorophyll
Concern for water quality standard

Impairment for standard

Concerns

Wilbarger Creek
Cedar Creek

E. coli

Station ID - Sample Location

Lower Colorado River Basin

Waterbody
- Colorado River
- Cummins Ck
- Alum Ck
- Lake Bastrop
- Skull Ck
- Lake Fayette
- Cedar Ck
- Wilbarger Ck
Summary

• **Drought Recovery**
  – Decreasing chloride, sulfate, TKN

• **Concerns for nutrients (especially nitrates) throughout the basin**
  – Especially downstream of urban areas

• **Concerns for chlorophyll a throughout basin**
  – Likely due to nutrient loads

• **Increasing trends in bacteria in specific areas**
Next Steps

• **Basin Summary Report Review**
  – Contact Aaron.Richter@lcra.org to be included in review
  – Deadline of notification is Friday, March 31

• **Stakeholder Review of BSR**
  – Report to be sent to reviewers Monday, April 3
  – Deadline for comments/edits is COB Friday, April 14
Questions?