Bacteria Levels in the Lower Rio Grande

Annual Water Quality Update and Basin Advisory Meeting

Elizabeth Verdecchia, USIBWC Texas Clean Rivers Program
What is the Texas Clean Rivers Program?

- State fee-funded program
- In every river basin in TX
- USIBWC collects water quality in the Rio Grande and Pecos rivers
  - Water quality monitoring
  - Assessment
  - Public Outreach

Identify & Evaluate Water Quality Issues

Provide data so that corrective actions can be prioritized and implemented
Texas Clean Rivers Program History

1991
Texas Clean Rivers Act

1998
TCEQ-USIBWC partnership established

Monitoring sites on the Rio Grande
- USIBWC CRP – 68 sites
- TCEQ – 35 sites
  - 9 duplicate
  - Total 91 stations

2012
What Does CRP do?

Water Quality Monitoring

- Routine monitoring
- Special Studies
What Does CRP do?

**Water Quality Assessment and Publications**

- Annual Basin Highlights Report
- 5-year report
- Watershed characterizations
What Does CRP do?

Public Participation, Outreach, & Education
What kind of data does CRP collect?

Routine parameters
- Field data (pH, DO, EC, Temp)
- Conventionals (nutrients, salts, BOD)
- Bacteria

Non-routine
- organics in sediment
- metals
- biological data
2012 Monitoring Stations

Map showing the 2012 Monitoring Stations in the Upper Rio Grande and Pecos Sub-Basins, Middle Rio Grande Sub-Basin, and Lower Rio Grande Sub-Basin.
2012 Monitoring Stations – Lower Rio Grande

18 stations
Local Partnerships – Lower RG
Help monitor, collect, and analyze

USIBWC MERCEDES
USIBWC FALCON
SABAL PALM SANCTUARY
UT BROWNSVILLE
US FISH & WILDLIFE
BROWNSVILLE PUB
USGS
TCEQ HARLINGEN
TCEQ CONTINUOUS WQ MONITORING
What happens to the data?

CRP and TCEQ regional offices collect and review data

Submit Data to TCEQ

TCEQ compares data to Standards

Segments not meeting standards are listed as impaired on the 303d List
# Texas Surface Water Quality Standards

For the Lower Rio Grande

<table>
<thead>
<tr>
<th>SEGMENT</th>
<th>USES</th>
<th>TDS (mg/l)</th>
<th>Bacteria (#/100 ml)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2301 – Tidal</td>
<td>• Primary Contact Recreation • Excellent Aquatic Life</td>
<td>--</td>
<td>35 Entero</td>
</tr>
<tr>
<td>2302 – Below Falcon</td>
<td>• Primary Contact Recreation • High Aquatic Life • Sole-source public drinking supply</td>
<td>880</td>
<td>126 E. Coli</td>
</tr>
<tr>
<td>2303 – Falcon Reservoir</td>
<td>• Primary Contact Recreation • High Aquatic Life • Sole-source public drinking supply</td>
<td>1,000</td>
<td>126 E. Coli</td>
</tr>
</tbody>
</table>
Integrated Report 303d List

IMPAIRMENTS ➔ don’t meet standards

CONCERNS ➔ almost don’t meet standards, or have high values of parameters for which there are no standards
2010 Impaired Waters in the Lower Rio Grande

- Total Phosphorus
- Ammonia
- Nitrate
- Orthophosphorus
- Toxicity in Water (Falcon)
- Bacteria (Arroyo Los Olmos)
- Chlorophyll-a
- Bacteria
- Ammonia
- Mercury in fish tissue
- Depressed DO
- Bacteria & Depressed DO
- Chlorophyll-a
Arroyo Los Olmos
Alex Flood Bacteria Sampling

- To support IBWC Mercedes flood operations
- USIBWC CRP collected 59 bacteria samples in structures, floodways, and Rio Grande flood waters
- Bacteria low
Brownsville Bacteria Special Study

To characterize bacteria impairment in Brownsville

- Planning Phase 2008-2009
- Sampling 2010
- Final Report 2011

Study did not pick up historically high bacteria
Brownsville Bacteria Special Study

RESULTS

• 63 total bacteria samples were taken
• Study did not pick up historically high bacteria
• Report documents total of 37 features on both banks
  • Pipes, drains, outfalls, structures
  • Trash dumps, goat trails
• No one feature could be pointed to as a likely cause
• Wastewater infrastructure improvements likely cause of decrease bacteria
Bacteria in the Brownsville Area

Historical E.coli Concentrations 2002 to 2011
Segment 2302_01 - Rio Grande Near Brownsville/Matamoros

- 13179
- 13178
- 20449
- 13177

Spike likely attributed to rainfall
Metamoros Wastewater Treatment Plant Begins Operations
Brownsville study sampling

Texas E.coli Single Sample Criteria
Texas E.coli Standard, Geometric Mean

Date
2002 2003 2004 2005 2006 2007 2008 2009 2010 2011
Matamoros Wastewater Plant

- First WWTP in Matamoros
  - Certified by BECC
  - Funded by NADBank in 2003
  - Completed 2008
  - Inaugurated 2009
- Secondary Treatment, Capacity 390 l/s
- Comprehensive Water and Sanitation Project

→ improving bacteria in the RG
Lower RG Bacteria Summary

**Increasing bacteria:**
- Rio Grande City
- Hidalgo/McAllen

**Decreasing bacteria**
- Brownsville (impaired section)
Projects in the Lower RG
Addressing bacteria and water quality

Lower Rio Grande Watershed Initiative

USIBWC CRP Watershed Characterization

TCEQ Continuous Monitoring
Lower RG Watershed Initiative

• Binational initiative
  • Pilot project to restore and protect water quality in the Lower Rio Grande/Río Bravo below Falcon Reservoir.
  • Goal → develop a binational watershed-based plan to reduce and mitigate pollutants of concern
  • Serve as an institutional model

Initial Aspects Include:
  Institutional analysis
  Stakeholder/ community interviews and surveys
  Preliminary identification of data gaps
  Outreach
Projects in the Lower RG
Addressing bacteria and water quality

**Watershed Characterization**

- Spatial Analysis Project to characterize impaired water bodies
  - Review land-use, discharges, hydrology, water quality, tributaries, etc
- Evaluation of sources of contamination
- Series of maps and recommendations
Continuous Monitoring

- Continuous Water Quality Monitoring (CWQM)
  - Evaluate TDS (salinity)
  - 8 CWQM stations used by TCEQ RG Watermaster
- ➔ important for irrigation
CRP Website
www.ibwc.gov/CRP/Index.htm

- Data
- Maps
- Calendar
- Publications
- Studies
- Links, etc
Thank you!

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