

**Lower Rio Grande, Rio Grande Estuary, and Lower Laguna Madre**

**Bay and Basin Expert Science Team (Lower BBEST)**

**First Meeting**

Thursday and Friday, May 26-27, 2011

University of Texas-Pan American, Edinburg, Texas

**MINUTES**

**Members Present:** Hudson DeYoe, Chair; David Buzan, Vice Chair; Jude Benavides; Bob Edwards; Carlos Marin; and Warren Pulich.

**I. Introductions and Minutes**

Chair Hudson DeYoe welcomed everyone to the meeting. Minutes for the May 20, 2011 meeting were distributed and will be considered for approval at the Friday session.

**II. Project Administration**

**Rio Grande, Rio Grande Estuary, and Lower Laguna Madre Basin and Bay Area Stakeholder Committee (BBASC) Report**

The next meeting of the Rio Grande BBASC is tentatively scheduled for the week of June 13<sup>th</sup>, 2011. Vice Chair will attend the meeting on behalf of the BBEST, if available. If acceptable, Cory Horan, TCEQ, can provide a status report on the activities of the Lower Rio Grande BBEST, if needed. Mr. Horan suggested the leads of each subcommittee prepare a summary of the respective activities for presentation at the meeting. He added that the BBASC formal deadline for their report to TCEQ is September 1, 2012 or six months from the official deadline of the BBEST, March 1, 2012. Mr. Horan discussed the lack of funding after September 1, 2011.

Follow-up: The Rio Grande BBASC meetings have been postponed until August 2011.

**Science Advisory Committee Remarks – Horan**

Mr. Horan stated that the SAC is presently reviewing work plans developed by the first two basin groups, Sabine and Trinity which will be submitted shortly. He mentioned that discussion points from their review will be relevant to the Lower Rio Grande BBEST. Vice Chair Buzan attended the last SAC meeting and discussed TCEQs presentation on the rule process

and adopted rules on environmental flow standards in the Sabine, Neches, and Trinity/San Jacinto Basins.

### **Budget Update**

Chair DeYoe reminded members to submit their time and expenses for the last meeting.

Carla Guthrie, TWDB, announced that the budget needs to be approved before any reimbursements can be made. She asked members to continue submitting their documentation as soon as possible so the group will know what funds are available. Chair DeYoe anticipated that the draft budget will be ready to submit by the end of Friday's session. Members discussed possible expenditures including attendance of SAC and BBASC meeting for presentation, etc. BBEST member Warren Pulich suggested preparing a detailed outline of studies and analysis to be done.

### **III. Workshop Overview (DeYoe)**

Members discussed the different geographic areas and noted the decision to not look at instream flows below Falcon Reservoir and Lake Amistad. The group is to look at the tidal portion of the Rio Grande, the Rio Grande below Anzalduas Dam and the Arroyo Colorado above tidal. BBEST member Jude Benavides stated he had the hydrologic data downstream of Falcon Reservoir. Cindy Loeffler, TPWD, added that the group should consider the historical data for the run of the reservoirs since the group is charged with determining the needs of the river. Members discussed the geo-scope of the charge and the group agreed to extend the scope to Anzalduas.

### **IV. Hydrology**

#### **Rio Grande (from Anzalduas to Gulf) and Arroyo Colorado Hydrology Data**

##### **(Carlos Marin and Jude Benavides)**

BBEST member Dr. Jude Benavides gave a presentation entitled "Methodologies for Estimating a Freshwater Inflow Regime for Texas Estuaries". He presented an overview of the hydrology of the Arroyo Colorado from the headwaters near Hidalgo to the Laguna Madre. He discussed streamflow and rainfall in the watersheds, and the sources of data and period of record for each. He discussed preliminary analysis of flow patterns to identify trends and what caused these patterns. He talked about the rainfall data and the transit times of the resulting flows from these events. He mentioned the critical areas and their roles in freshwater

inflows. He said the system operation is extremely complex with high flow diversions (bi-national), and the flow response being a function of flood reservoir storage availability. He presented a list of the gages available.

### **Laguna Madre Estuary; Hydrology, Hydrodynamics & Salinity (Guthrie)**

Dr. Carla Guthrie, TWDB, presented an overview of the hydrology, hydrodynamics and salinity of the Laguna Madre Estuary. She discussed the major hydrology components used and gave a brief history of the coastal hydrology. She talked about the freshwater inflow to the Lower Laguna Madre and the significance of each flow component. She explained how ungaged flows are calculated and talked about the Hydrodynamic and Salinity Transport Model (TxBlend) explaining the data used in the model and how the salinity concentrations are derived. She presented an update on the current status of hydrodynamic modeling for the Lower Laguna Madre, Arroyo Colorado tidal, South Bay, Brownsville Ship Channel and Rio Grande tidal areas. She stated that TWDB and TPWD used the TxBlend model for the freshwater inflow analysis that was completed 7 years ago. Ms. Guthrie discussed the freshwater inflow estimates, hydrology estimates and TxBlend. Once the estimates are completed, a presentation will be made to the members that will include an overview of the available data, drainage basins, and modeling considerations.

## **V. Ecological Data Review**

### **Availability of Data in the Lower Laguna Madre (Lingo)**

Mark Lingo, TPWD, made a presentation on the available data in the Lower Laguna Madre. He discussed the history of the sampling program, what data was collected and summarized the sampling techniques used. He presented several slides summarizing the analysis of the historic salinity data and changes over time. He presented three factors responsible for moderation of hypersaline conditions in the Lower Laguna Madre: increased exchange with the Gulf, increased precipitation, and increased flow into the Laguna from the Arroyo Colorado and North Floodway. He discussed how the group can access the data and the information needed. He suggested using species diversity for a proxy for a healthy system.

He discussed the shifts in species occurring in the Lower Laguna Madre and noted that the decrease in blue crab is the only one that is contributed solely to increases in temperature. Members discussed the use of sea grass with the results of TxBlend and salinity to see how flows are affecting

specific parts of the system. It was added that emphasis should be more on localized effects rather than system wide effects. Nitrogen enrichment surveys with respect to the inflows from the Arroyo were also mentioned as a tool. Chair DeYoe discussed algae and its relationship to sea grass. Mr. Lingo discussed tidal monitoring and data summaries of salinity, and assemblages. He noted the presence of invasive plants and the lack of monitoring above the tidal zones.

Members discussed the US-Mexican Army Survey dating back to the 1850s. Much of the biological data available from the Laguna Madre is from this survey and there are indications of freshwater inflows at that time. More recent data indicates an influx of more and more marine species which is correlated to the loss of freshwater inflows.

Members considered whether the current conditions were reflective of a sound ecological environment. However, no decision was made. Mr. Lingo mentioned the nighttime migration pattern of some species and that the time of day and season are important to consider. Warren Pulich discussed the salinity wedge, sea vegetation and results of the study by Hudson and Pulich in the lower 15 mile reach.

Mr. Lingo discussed the biological data from the Arroyo. He noted that the saltwater ecological boundary in the Arroyo is the Rio Honda bridge. He said that there is no quantitative information regarding the biotic community of the resacas. Carlos Marin will check with Ambiotec to see what data is available.

Members decided not to look at the riverine portion below Falcon Reservoir.

### **Public Comment**

There was no public comment at this time.

### **Friday May 27, 2011 Session II**

Chair DeYoe welcomed members to the second session. He summarized what needed to be completed during the session: Geographic scope, Budget discussion

## **VI. Water Quality Data**

## **Arroyo Colorado and Lower Rio Grande Water Quality Overview (Miranda)**

Roger Miranda, TCEQ, presented an overview of the water quality data collected at various gages in the Arroyo Colorado and Lower Rio Grande. He presented graphs of data collected at the gages showing how different water quality parameters vary with changes in flow rate. He discussed the history of water rights in Mexico and what authorization is required for different uses. He talked about the instream flow provision that is in the Mexican law and what would be needed to enact the provision. He stated that the amount of water removed from the Mexican side must be within the bounds of the treaty and all water rights must fall within treaty confines. Mr. Miranda noted the historical records of the diversions on the IBWC website and how useful the data would be in water balance calculations. Members discussed diversions from the Rio Grande that occur between Anzalduas to Progreso. Dr. Buzan noted that there is nutrient data available in the Arroyo.

Mr. Horan suggested that members just contact him or Mr. Miranda with any specific data retrieval requests.

## **Ecological Characterization of the Rio Grande Tidal Estuary (DeYoe)**

Chair Hudson DeYoe gave a presentation on the ecological characterization of the Rio Grande Tidal Estuary. He discussed an ongoing study of the Rio Grande Estuary focusing on aquatic plants and how they correlate to flow conditions, water quality and barnacle colonization as a means to determine the estuarine area. He talked about land cover and the composition of the wetland plant communities along the riparian corridor of the Rio Grande estuary. He talked about the water quality of the water column at different sample sites and what parameters were monitored.

Members did not decide if the current conditions of the Arroyo were representative of a sound ecological environment but did acknowledge that it was a changed system and did not conclude what species would benefit from the present environment.

Members discussed the geographic limit of the scope. Dr. Pulich proposed to limit the scope from just below Anzalduas to above the salt water barrier at Brownsville for purposes for evaluating flows. Members identified four areas; Laguna Madre, Lower Laguna Madre, Lower Rio Grande tidal,

Arroyo Colorado Estuary and Ship Channel Resaca area. If members decide not to make a recommendation it will be noted in the report with a description of the area.

Members decided to use a quantitative approach where possible and use a qualitative approach in other areas. Qualitative includes: resacas, Rio Grande above tidal to Chimney Park, Arroyo Colorado above tidal. A quantitative approach will be taken at Laguna Madre, Rio Grande estuary and Arroyo estuary. Members were unsure what will be done on the Arroyo Colorado tidal.

Members requested data and studies including the hydrology/water budget from SAC member Bob Brandes. The group will perform additional evaluations if needed. Members also requested a summary of the IBWC diversions and contributions as well as releases from dams and withdrawals from wells.

Chair DeYoe distributed a draft outline of the final report.

The estuary/biology subcommittee (Buzan, DeYoe, Pulich, and Edwards) will look at the three systems, determine whether a sound ecological environment exists, determine the period of record and characterize the flow regime including indicator species or guilds for the sound ecological environments.

### **Approval of Minutes**

Members discussed proposed changes to the minutes May 20, 2011 meeting. Members approved the minutes of the May 20, 2011 minutes as revised.

### **Member Assignments**

- Water Budget for Rio Grande (Marin and Benavides)
- Investigate IWBC diversion data and Mexican return flows (Benavides)
- TxBlend model, calibrated/validated by June (TWDB)
- TPWD data by June 6, 2011
- Update seagrass distribution map for LLM (Pulich)
- Organize/interpret fisheries for LLM, Arroyo and Rio Grande (Edwards)
- Mexican water issues (Miranda)

- Protocol ECHO data download (Miranda)
- Fish data for Arroyo (Miranda)
- Find and distribute Harrison and Rogers (2009) Rio Grande Study (Horan)
- Review Arroyo WQ study and fish kill data for Rio Grande and Arroyo (Buzan)
- Forward LLM salinity data to TWDB for model (DeYoe)
- Water Quality data from SWQMIS from Anzalduas
- Review of TPWD/Montagna data on benthic in Rio Grande tidal (Buzan)
- IBWC data availability (Horan to coordinate with Benavides)
- Review literature on salinity/nutrient effects on seagrass (DeYoe)
- Begin qualitative summaries for
  - o resacas (Buzan),
  - o San Martin Lake (Buzan and DeYoe)
  - o Bahia Grande (DeYoe)
  - o And Above tidal Rio Grande
    - fish-Edwards,
    - riparian vegetation (Pulich)
    - water quality (DeYoe)
- Investigate Mexican Water rights (Miranda)
- Request data/studies hydrology/water budget from Brandes

#### Upcoming Events

- June 13, 2011 BBASC Meeting
- June 14, 2011 BBEST Conference Call for Edwards, Pulich, Buzan and DeYoe

#### **Set Next Meeting**

The next meeting is scheduled for Thursday and Friday, June 30 and July 1, 2011 at 9:00 a.m. at University of Texas-Brownsville, Texas. The following meetings are tentatively scheduled for the dates and locations listed below. Members will be notified with the time and location.

- Wednesday/Thursday, July 20 and 21, 2011
- Tuesday/Wednesday, August 16 and 17, 2011

#### Proposed Agenda Items

- Presentation on Three Systems Preliminary Analysis
- Discussion on POR/SEE/Species and Freshwater Inflows

- Presentation water budget/inflows to Rio Grande/Arroyo tidal (Jude/Carlos)
- Watermaster discussion
- Review Areas for qualitative/quantitative approach
- Presentation by Buzan, DeYoe on areas for qualitative summaries
- Budget Discussion
- Discussion of factors to address in individual analyses
- Rio Grande QAM analysis

### **Public Comment**

There was no public comment at this time.

### **Adjourn**