

**Guadalupe, San Antonio, Mission, and Aransas Rivers and Mission,  
Copano, Aransas, and San Antonio Bays Basin and Bay Area Stakeholder  
Committee (GSA BBASC) Meeting**

Monday, March 25, 2019; 2:00 p.m.  
GBRA River Annex, Seguin, TX

**Meeting Minutes**

**Members Present**

Suzanne Scott, Chair; Dianne Wassenich, Vice-Chair; Jim Bower; Terry Dudley; James Dodson for Ken Dunton; Jennifer Ellis; Charlie Flatten; Colin McDonald; Micah Voulgaris for Milan Michalec; Doris Cooksey; Steve Raabe for Con Mims; Tommy Hill; Jace Tunnell; Thurman Clements, Jr.; Gregg Eckhardt for Robert Puente; Julia Carrillo for Roland Ruiz via teleconference; David Mauk via teleconference.

**Public Comment**

No public comments were made at this time.

**Discussion and Agreement on Agenda**

The Agenda includes discussion on revised meeting rules, vacancies, and updates on seven ongoing studies. Members agreed to proceed forward with the agenda as drafted.

**Approval of Meeting Minutes**

The minutes from the September 15, 2017 meeting were approved by consensus.

**Briefing of Ongoing GSA BBASC Studies**

- 1) Statewide Synthesis of Environmental Flow Studies from 2014-2017
  - a. Dr. Thom Hardy gave an update on the statewide synthesis project that is being conducted in several basins throughout the state. He introduced the team working on the project and gave a brief overview of their backgrounds. The goal of the project is to evaluate the applicability of past environmental flow studies for meeting the goals to refine or validate the analysis, as part of the Senate Bill 3 (SB3) process. The team will investigate whether the studies have produced adequate data to inform the evaluation needed going forward. They will perform a synthesis of study findings within basins and longitudinally across five basins. The team will review 33 studies that supported the SB3 adaptive management process and will synthesize peer-reviewed publications on instream flow assessment validation projects. The study will evaluate international literature into the process. The team has instream flow and estuary specialists to balance the review. The team will be checking for clear objectives and hypotheses, background information sufficient for methods, and will evaluate study sites, data collection, analysis, and coherence in results and recommendations. The team will also evaluate existing work plans, with suggestions for refinement. Each study will be assessed internally within the basin and then will be compared to similar

studies across basins. The project will feature a two-level review process because individuals on the team are authors on some reports. The authors will be recused from peer-review, but they may be interviewed for insights into their studies. The team will also have three out-of-state experts review material and assess the peer-review comments for bias. The team will create a bibliography with local and international studies. They will hold stakeholder presentations via webinar and will present findings at the end of the study. The team aims to finish the project by April 2020, but the project will be finalized by August 2020 at the latest.

- b. Mr. Terry Dudley asked when the webinars would occur. Dr. Hardy responded that webinars will be held as needed throughout the project and will include a Q&A exchange between the study team and groups.
- 2) Assessing the effects of freshwater inflows and other key drivers on the population dynamics of blue crab and white shrimp using a multivariate time-series modeling framework
- a. Dr. Lindsay Scheef, University of Texas Marine Science Institute, presented an update on phase II of the study on drivers of blue crab and white shrimp populations at various time scales. Phase I used data from 1982 to 2013 to model drivers of blue crab and white shrimp abundances in San Antonio, Mission, Aransas, and Guadalupe estuaries. The report is available online. The study detected lag effects for predators, temperature, and discharges, but the lag times were different. Phase II aims to update datasets up to 2015 and reformat the datasets to reflect the environmental flow standards' seasonal increments. Dr. Scheef will adapt the model to include inflows during different seasons to model species abundances. During phase I, Dr. Scheef used a multivariate autoregressive model with auto-regression. Dr. Scheef reran the models with updated data and compared coefficients in the original model compared to the coefficients in the updated models. The added data didn't drastically change the results. The next task was to determine seasonal models with year lags of up to two years. Dr. Scheef focused on trawl data for predictor variables, since they were taken year-round. She also removed salinity and predators as predictors. She focused on temperature and river discharge as predictors with zero-, one-, and two-year lags for crab and zero- and one-year lags for shrimp. Overall, higher summer temperatures negatively impacted both blue crab and white shrimp abundances. Large increases in winter river discharge showed a positive impact on blue crab abundance and summer river discharge positively impacted white shrimp abundance.
  - b. Chair Suzanne Scott asked if Dr. Scheef decreased the flow in the model. Dr. Scheef did not decrease the flow, but she would expect the opposite trends to be true. Dr. Scheef said she could input decreased flows and run the model. Mr. Colin McDonald asked where the temperature measurements were collected. Dr. Scheef responded that water temperatures were taken at each trawl sample. Mr. Charlie Flatten asked if

more flow led to decreasing temperatures. Dr. Scheef responded that temperature has a long-term effect over time, but she didn't put it in the model to tease out a relationship between discharge and temperature. She stated that we can't change temperature, but recommendations can be made based on inflow requirements. Dr. Scheef said she can run the model to look at that relationship. Mr. Sam Vaughn asked if species abundance was more highly correlated with temperature than discharge. Dr. Scheef said that blue crab responded more to temperature and white shrimp responded more to freshwater inflow. She stated that other factors could be affected by temperature, such as disease. Mr. Gregg Eckhardt asked if the model could accept an input such as a change in flow in the amount of unused water rights if they were to be utilized. Dr. Scheef replied that she didn't have the data readily available, but if she did have the data she could input that into the model. Dr. Norman Johns said that would be a scenario model and the BBEST and BBASC may want to evaluate the applicability of the model for that purpose.

- 3) Seasonal ecological assessment in the upper Guadalupe Delta
  - a. Mr. Ed Oborny gave an update on the project to initiate the establishment of a baseline for marsh productivity. The study will look at salinity and inundation effects on marsh vegetation and salinity and habitat effects on aquatic organisms. The project started with reconnaissance to identify any longitudinal trends with freshwater inflow. The team identified three sites with varying amounts of freshwater inflows within the delta. The project will sample plants and aquatic organisms in Spring and Fall in transects on 1 m<sup>2</sup> plots. Mr. Oborny hopes to get an extension to allow for sampling in Fall 2019 and will hopefully have a report completed by December 2019.
  - b. Dr. Hardy asked if water quality will be sampled. Mr. Oborny responded that standard water quality measurements will be taken. Mr. Dudley asked if physical measurements would be taken. Mr. Oborny said that elevation will be taken at the transects.
- 4) Using comparative long-term benthic data for adaptive management of freshwater inflow to three estuaries
  - a. Dr. Melissa Rohal gave an update on behalf of Dr. Paul Montagna regarding the long-term benthic data project. The project seeks to analyze archived benthic samples from Lavaca-Colorado, Guadalupe, and Nueces estuaries. Studies have provided information on key faunal species including *Rangia* clams and nutrient concentrations from quarterly samples taken over the past 32 years. Domino theory helps explain how effects of freshwater inflows cascades to change estuary conditions to effect estuary resources. The study will link estuary conditions to benthic response using models to find the optimal salinity ranges. Benthic organisms make good bioindicators because they don't move, are long lived, diverse, and integrate short-term events over long time scales. The Texas coast creates a natural experiment along a freshwater inflow gradient as you move northeast to southwest along the coastline. There is

an effect of decreasing inflow and increased salinity in each estuary along the coast. Studies have focused on the coastal bend region because there are strong inflow drivers and differences. The study will compare hydrologically positive, neutral and negative estuaries across the climatic gradient and secondary bays near rivers with primary bays near the gulf. Inflow drives estuary conditions. The study found that fresher bays have higher inorganic nutrient compound concentrations and the concentrations decrease as salinity increases. Salinity variability drives changes in biodiversity. Droughts mainly effect juvenile life stages and the increase in size is due to the die-off of juveniles because the adults survive. The study found long-term decline in benthos in all studied bays except Upper San Antonio Bay. Dr. Rohal stated that a draft report is expected in July 1, 2019.

- b. Vice-Chair Dianne Wassenich asked for a clarification on positive and negative estuaries. The response was that negative estuaries have more evaporation than freshwater inflow.
- 5) Environmental Flows Validation in Three River Basins (Brazos, Colorado-Lavaca, and Guadalupe-San Antonio)
- a. Dr. Kirk Winemiller gave an update on the environmental flows validation work starting in three river basins. The current environmental flow regime in Texas is broken into component parts: subsistence flows, base flows, and various high flow pulses. The study will quantify the value of the flow components to the ecology of the system. The study will look at indicator species to understand how individual flow components influence the species. Potential indicators for the study were the shoal chub and alligator gar, with rapid and slow life cycles, respectively. Shoal chub require low magnitude flow pulses and alligator gar require high magnitude flows. The study will focus on shoal chub as an indicator, because the study timeframe is not appropriate for sampling of the alligator gar. The study will also investigate how high flow pulses maintain lateral connectivity between floodplains and the river channel. The project will end on December 15, 2020. The team will look at available data from recent studies to analyze the datasets in different ways to tease out the value of flow components, particularly high flow pulses. After the data analysis task, the team will select flow-response indicator species to sample. The study will back-calculate the flow histories leading up to successful recruitment of the species.
  - b. Indicator species will likely include shoal chub, alligator gar (using ongoing studies), mussels with fast and slow life histories, and riparian trees with fast and slow life histories. Fieldwork will be conducted at three to four locations within lower reaches of the Guadalupe, Colorado, and Brazos rivers. The team will statistically analyze the mechanisms involved that link flow to recruitment success. They will use trend analysis on existing data to develop guidance for long-term monitoring. They will develop guidance materials for stakeholders, in a video and workshops and will also do some scenario simulations.

- c. Chair Scott asked if the study will take into account past environmental flow validation studies that have been done. Dr. Winemiller responded that the project will analyze existing data but will analyze it in different ways than prior studies. The study will focus on high flow pulses. Chair Scott expressed that the BBASC will need to determine how to synthesize the science to inform future recommendations to the TCEQ. Mr. Jason Godeaux, Texas Commission on Environmental Quality (TCEQ), stated that 2022 is the soonest TCEQ could receive recommendations from the GSA BBASC group.
- 6) Nutrient and Sediment Monitoring in Four Lower River Basins
- a. Mr. Mike Lee, United States Geological Survey (USGS), gave an update on the ongoing USGS project in the Guadalupe River. The project location is the gage at the Guadalupe River at SH 35 near Tivoli, TX, which is the closest gage to the bay. The USGS is operating and maintaining an index velocity gage to measure sediment loading. They are collecting data on backscatter and water quality. The gage was installed in March 2013 and started transmitting data in 2016. USGS has taken over 50 discharge measurements to calibrate the index velocity gage. Hurricane Harvey damaged the site and USGS had to replace the gage. They have taken over 40 discrete water quality samples at the site. They collect suspended sediments, bed sediments, nutrients, and physical parameters. They measure backscatter from the acoustic doppler velocity instrument to develop a model of suspended sediment in real-time. USGS created an online dashboard to provide the data to the public more easily.
  - b. Once the model is developed, it can be applied at the gage to create a continuous relationship between discharge and suspended sediment. The team has many samples at base flow and at high flows, but not many samples at moderate flows. USGS can apply the calibrated model to measurements since the inception of the gage in 2013. That data is currently available online. The USGS found about 50% loss from flows upstream to the downstream gage. A potential project would be to analyze streamflows at gages in the lower reaches of the river to identify where water is going and whether sediment and nutrients are bypassing the mainstem of Guadalupe. The USGS will do reconnaissance of bayous during high flow conditions to evaluate how much water is bypassing the mainstem. In future studies, USGS may look at the magnitude of unaccounted flow.
  - c. Vice-Chair Wassenich asked whether it's possible that the Guadalupe diversion canal was sequestering freshwater inflows during small rain events. Mr. Lee responded that there are many ungaged locations, such as the diversion canal, that can only be estimated. Mr. Tommy Hill commented that there is a gage that measures water into the diversion canal. Mr. Colin McDonald asked about the location of the salt water barrier. Mr. Lee responded that the salt water barrier is right below the Tivoli gage.

### **Briefing on Revised Rules**

Chair Scott stated that an additional rule was approved at the prior meeting but had not been reflected in the updated rules and will need to be added. The BBASC had decided to require nominees to fill vacancies in certain stakeholder groups must have a recommendation from the entity they will represent. Chair Scott reminded the group that members serve for a term of five years. The meeting where members restarted their terms was March 2017, so the member terms end on February 2022. The timing is crucial due to the date when the BBASC can submit recommendations to TCEQ.

### **Discussion on Committee Vacancies**

Chair Scott discussed the vacancies that need to be filled on the BBASC. There are vacancies for the following stakeholder groups: regional water planning groups, soil and water conservation district, and river authorities. The BBASC would approach Region L, soil and water conservation districts, and river authorities to solicit nominees for those vacancies. Chemical manufacturing, recreational water users, municipalities, and commercial fishermen are open vacancies. Chair Scott suggested a conference call for the next meeting to vote on filling the vacancies. The nominations for municipalities, regional water planning groups, soil and water conservation districts, and river authorities will require a letter of recommendation from the entity. Chair Scott stated that industrial refining may have a vacancy open soon, as well. The nomination window will end on September 2, 2019.

### **Set Next Meeting Date, Time, and Location**

Chair Scott stated that the next meeting will be a conference call meeting to fill current vacancies and will likely occur in September or October 2019. Another meeting will likely follow in December 2019 or January 2020 to receive updates from the study groups.

### **Agenda Items for Future Consideration**

The BBASC asked about when draft reports from current studies will need to be reviewed. Ms. Caimee Schoenbaechler, Texas Water Development Board (TWDB), said that the report will be out in June or July 2019 and Chair Scott responded that there will be a subcommittee gathered to review the draft report. Chair Scott asked about the potential for future funding. Ms. Schoenbaechler responded that if the two million dollars requested for environmental flow studies is funded for fiscal year 2021, then TWDB will likely ask for study recommendations from the BBASC groups in September 2019.

Mr. James Dodson expressed interest in seeing impacts of environmental flow standards on the issuing of water rights permits in Guadalupe and San Antonio basins. He asked if the standards were applied and what were the results. He suggested a run of the Water Availability Model (WAM) to identify the effect of any new permits on flow compared to a baseline before the standards were applied. Mr. Godeaux responded that he would ask if that could be made available.

### **Public Comment**

No public comments were made at this time.

**Adjourn**