

Defining Bioindicators for Freshwater Inflow Needs Studies (BioFINS): Phase 2 The health of the bay.

Brief for the Trinity-San Jacinto BBASC meeting
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Scope of Work:

Phase 2 - The Health of Galveston Bay

(A) *We will revisit the original intent to identify bioindicator species (including those considered by Espey et al. (2009)) to characterize a sound ecological environment for Galveston Bay.* The definition of a *sound ecological environment*, as determined by the Senate Bill 3 (SB3) Science Advisory Committee (SAC 2006, 2009) is:

- (a) *sustains the full complement of native species in perpetuity,*
- (b) *sustains key habitat features required by these species,*
- (c) *retains key features of the natural flow regime required by these species to complete their life cycles, and*
- (d) *sustains key ecosystem processes and services, such as elemental cycling and the productivity of important plant and animal populations.*

Using the SAC definition, we will ask the following question: **Will the freshwater inflow standards allow for the persistence of a bioindicator species and thus a healthy bay?**

If yes, then the flow standards can be considered to be supportive of a sound ecological environment. If not, then the flow standards can be considered to not be supportive of a sound ecological environment, and the bay could be deemed unhealthy or potentially entering an unhealthy state.

To address the SAC definition of a *Sound Ecological Environment* the following questions will also be addressed, if and when sufficient and appropriate data is available to do so. Specifically:

(a) *sustains the full complement of native species in perpetuity,*

What “community metric(s)” might be used to quantify the “full complement of native species?”
What key quantifiable bioindicator(s) might be correlated to such a metric, and what is the extent of this correlation?

(b) *sustains key habitat features required by these species,*

What is the extent of the relationship in abundance of key bioindicators and/or community metrics as related to submerged aquatic vegetation habitat?

(c) retains key features of the natural flow regime required by these species to complete their life cycles.

How should the hydrology be characterized for maintaining a natural flow regime?

What features of the natural flow regime are correlated to the metric of key bioindicators and/or community metrics?

What is the extent of this correlation?

(B) *We will work with TWDB and the best available science to evaluate the freshwater inflow standards for Galveston Bay.* In order to do so, we will start with a simple comparison of the instream flow standards adopted by TCEQ for the Trinity and San Jacinto Rivers with the freshwater inflow standards adopted by TCEQ for Galveston Bay. This will be tabulated such that we will be able to visually determine if there is alignment between the two sets of standards, and if the instream flow standards are adequate to maintain a healthy estuary.

This will allow us to address a second important question: **Will the freshwater inflow standards allow for the persistence of a bioindicator species and/or community metrics and thus a healthy bay?**

If yes, then the flow standards may be considered to be supportive of a *sound ecological environment*. If not, then the flow standards cannot be considered supportive of a sound ecological environment.

Project updates:

Established a technical guidance committee (TGC) is to provide feedback and guidance throughout this process. We will meet monthly early on and move to quarterly. One meeting held in October. Next meeting: December.

TGC: Glen Clingenpeel (TRA); Bill Espey and Tony Smith (RPS Group); George Guillen (UHCL/EIH); John Bartos (BBASC) and Jim Lester (HARC, retired)

TAMUG: Jamie Steichen and Rachel Windham

**Contract executed; Quigg still awaiting funding.

TAMUG team has started preliminary work in earnest in preparation for the December meeting.