



Water Grand Challenges: Physical Processes

Environmental Flows

Background – The purpose of environmental flows management is to establish a flow regime to support healthy ecosystems. In 2007, environmental flows were established in Texas through Article 1 of [Senate Bill 3](#). This water allocation process attempts to address the trend of over-allocation, maintaining healthy coastal estuaries and rivers in Texas, and how to protect water sources.¹ Rivers must carry a certain amount of water in order to maintain healthy riparian systems and aquatic biota in its beds, banks, bays, and estuaries.² In Texas, the over-allocation of surface water rights has necessitated legislation to define, quantify, and provide adequate environmental flows.³ In watershed basins with resources that are already over-allocated, permit cutbacks do not necessarily apply. The purpose of S.B 3 bill is to strike a balance between surface water extraction rights and healthy rivers and bays.

The ability of river basin and bay systems in Texas to perform valuable functions for maintaining the health and well-being of wetland and riparian ecosystems depends on adequate freshwater flows. Additionally, with adequate flow, rivers, bays, and estuaries provide valuable ecological services in the form of aquifer recharge, storm surge buffers, and as natural waste treatment facilities for non-point source pollution. Rivers also provide surface water for agriculture, industry, energy production, and municipal and recreational users. Healthy bays contribute billions of dollars to the state economy through the fishing industry, wildlife protection, tourism, and recreation. Estuarine ecosystems support industries totaling a combined \$3.5 billion per year (1994 dollars). This includes seafood, sport fishing, and recreational industries.⁴ Inadequate freshwater discharge into Texas' bays leads to increased salinity, poor biological health, and economic loss.

Environmental Flows Process –Recognizing that each river and bay system in Texas has unique properties, the state is divided into different regions in order to adopt legal standards that best fit the variety of unique environmental conditions (Fig.1).¹ These standards are adopted through a public process through which information about the region is gathered from local individuals with the most knowledge about local basin information.¹

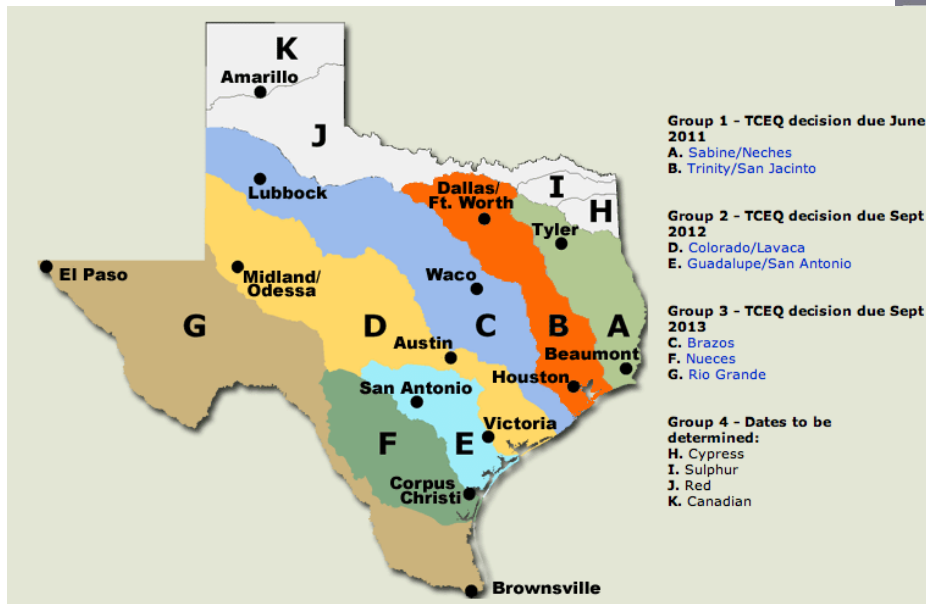
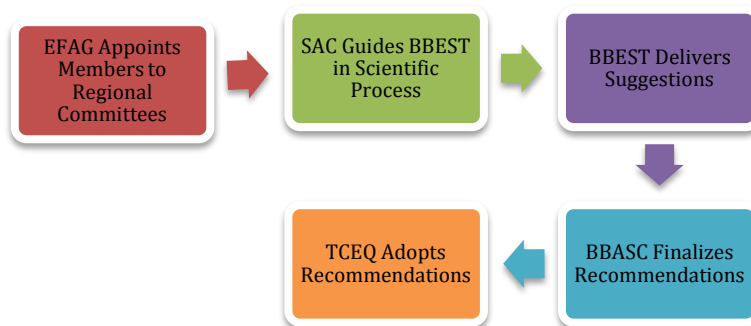


Figure 1: River basin regions of Texas¹

The Environmental Flows Advisory Committee (EFAG) is made up of three state senators, three state representatives, and one representative from each of the following state agencies: the Texas Water Development Board, Texas Department of Parks and Wildlife, and the Texas Commission on Environmental Quality (TCEQ).¹ This group is responsible for appointing members to regional committees across the state. The different regions of the state each have a Bay/Basin Expert Science Team (BBEST) and a designated Bay/Basin Stakeholder Committee (BBASC) comprised of people with different backgrounds and interest groups.¹ A nine-member Science Advisory Committee (SAC) provides BBEST groups with guidance and “consistent application of scientific principles” during this process.¹ BBEST makes recommendations based on scientific observations and study of local basin water requirements to BBASC. After considering BBEST suggestions, BBASC then will add policy recommendations to the suggested flow regime and develop strategies for implementing BBEST flow recommendations. Once BBASC has finalized their recommendations, the Texas Commission on Environmental Quality has one year to adopt the BBASC proposed actions and “set aside” water that has not yet been allocated.¹





¹ Texas Water Matters. The Environmental Flows Allocation Process. October 4, 2010.
<http://www.texaswatermatters.org/flows.htm> (accessed May 14, 2013).

² UNESCO-IHE Institute for Water Education. "Online Courses." Environmental Flows. n.d. <http://www.unesco-ihe.org/Education/Non-degree-Programmes/Online-courses/Environmental-Flows> (accessed February 19, 2013).

³Environmental Flows FAQs. n.d. <http://www.twdb.state.tx.us/surfacewater/flows/environmental/index.asp#content> (accessed February 21, 2013).

⁴ Texas Water Development Board. Statewide Environmental Flows. n.d.
<http://www.twdb.state.tx.us/surfacewater/flows/environmental/index.asp> (accessed February 28, 2013).